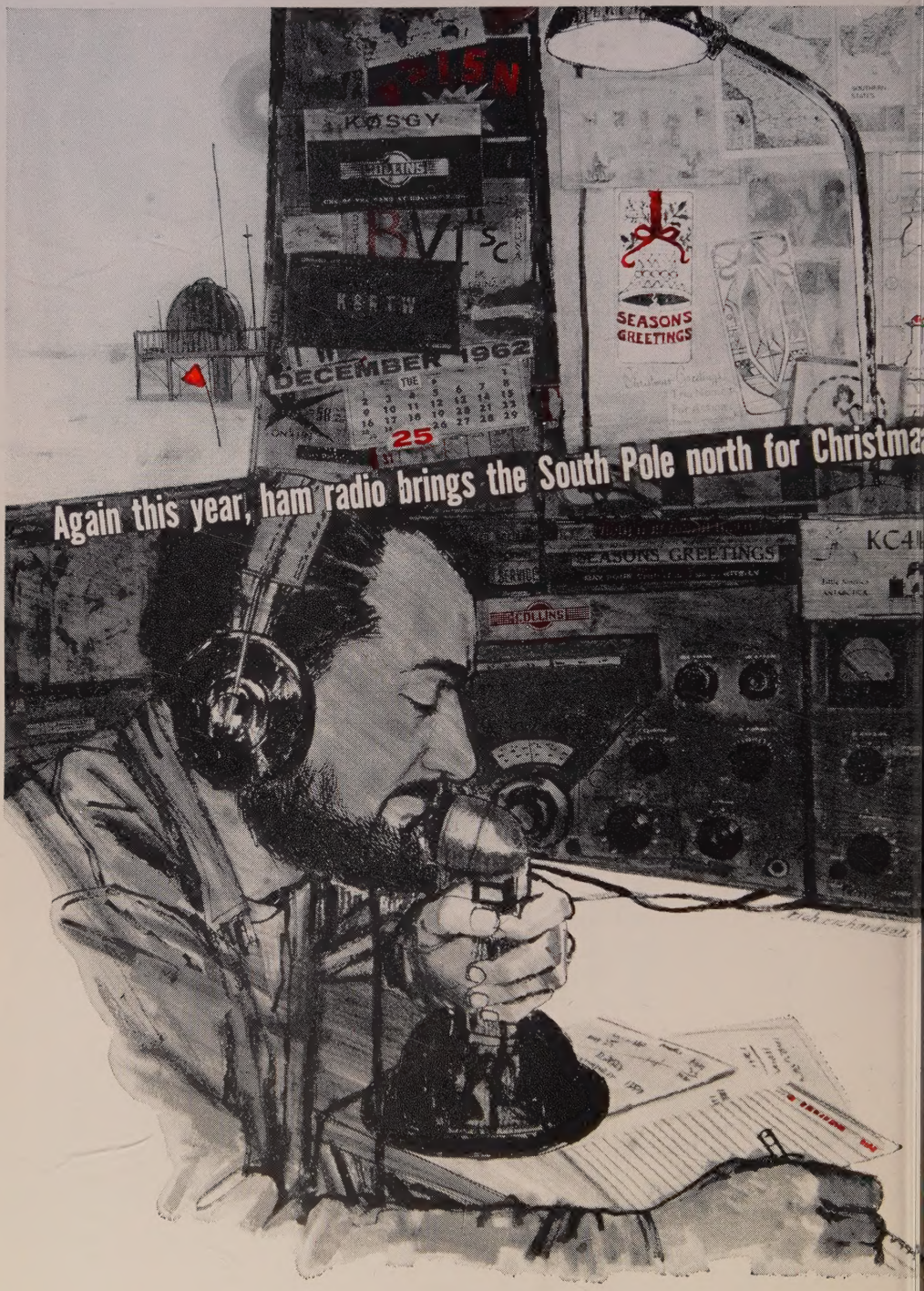
December 1962
50¢

# CQ

UNIVERSITY OF ILLINOIS
LIBRARY
DEC 4 1962
CHICAGO

The Radio Amateur's Journal


Again this year, ham radio brings the South Pole north for Christma
SEASONS GREETINGS
DECEMBER 1962
25
COLLINS

COLLINS

# ALL PR CRYSTALS are Continuously Monitored for Frequency During the Lapping Process

## AMATEUR TYPES

FUNDAMENTAL, PR TYPE Z-2—Frequency Ranges in Kcs.: 3,500 to 4,000 (80-M); 7,000 to 7,425 (40M); 8,000 to 8,222 (2M); 8,334 to 9,000 (6M) ± 500 Cycles . . . $2.95 Net

(All Z-2 Crystals calibrated with a load capacity of 32 mmfd.)

Third Overtone, PR Type Z-9A, 24,000 to 24,666 and 25,000 to 27,000 Kc., ± 3 Kc. . . $3.95 Net

6 Meters, Fifth Overtone, PR Type Z-9A, 50 to 54 Mc., ± 15 Kc..... $4.95 Net

Citizens Band, PR Type Z-9R .005% ..... $2.95 Net

**MINIMUM ORDER $10.00**

**ORDER FROM YOUR JOBBER**

Precision at every stage of manufacture is responsible for the outstanding excellence of PR CRYSTALS. Here is a view of the Lapping Room, where blanks for PRs, previously cut and edged, are ground smooth to specified frequency, ready for etching to insure absolute stability during the life of the crystal. During the lapping, the crystals are continuously monitored for frequency with Collins 51J receivers.

PRs are in the rigs of thousands of proud Amateurs. They are famous for accuracy, dependability, high activity and low drift. Every PR CRYSTAL is UNCONDITIONALLY GUARANTEED. Get yours today from your jobber.

**PR Crystals**

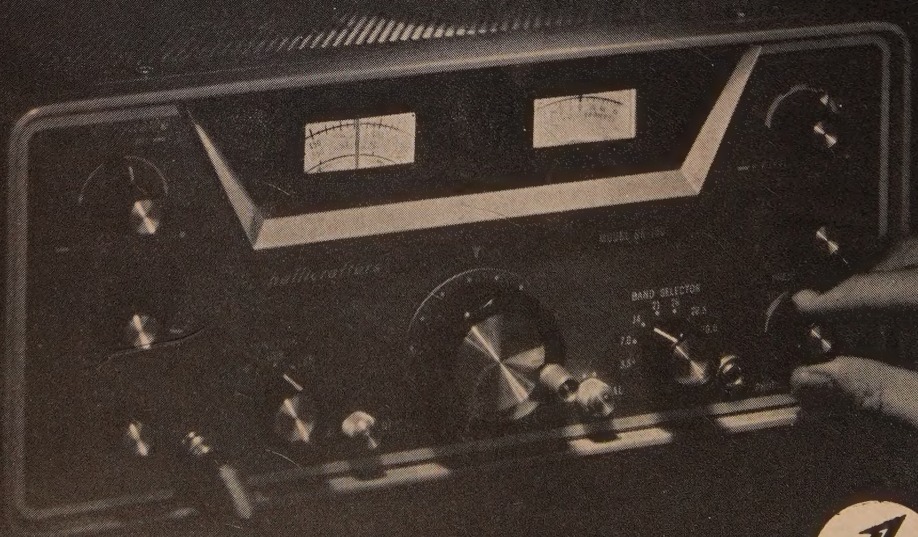
Since 1934

USE PR AND KNOW WHERE YOU ARE

PETERSEN RADIO COMPANY, INC.
2800 W. BROADWAY • COUNCIL BLUFFS, IOWA

For further information, check number 2, on page 128

*No finer service*
*can be rendered to mankind*
*than communication of*
*the greatest of all ideas*
*... the hopeful message*
*of Christmas*




the hallicrafters co.

CQ

The Radio Amateur's Journal

Vol. 18, No. 12 December 1962

## Editorial Staff

EDITOR
A.S. TROSSMAN, W2DTJ
ASSOCIATE EDITOR
RICHARD A. ROSS, K2MGA
TECHNICAL EDITOR
IRVING TEPPER

CONTRIBUTING EDITORS
CONTEST CALENDAR
FRANK ANZALONE, W1WY
USA-CA CUSTODIAN
CLIF EVANS, K6BX
PROPAGATION
SPACE COMMUNICATIONS
GEORGE JACOBS, W3ASK
RTTY
BYRON KRETZMAN, W2JTP
DX
URB LE JEUNE, W2DEC
YL
LOUISA B. SANDO, W5RZJ
HAM CLINIC
C. J. SCHAUERS, W4VZO/HB9
V.H.F.
DONALD L. STONER, W6TNS
SIDEBAND
DOT STRAUBER, K2MGE
IRVING STRAUBER, K2HEA

BUSINESS STAFF
PUBLISHER
S. R. COWAN
ADVERTISING REPRESENTATIVES
JACK SCHNEIDER, WA2FPE
DICK COWAN, WA2LRO
CIRCULATION MANAGER
HAROLD WEISNER, WA2OBR
PRODUCTION MANAGER
CARY L. COWAN

OFFICES
300 West 43rd Street
New York 36, N. Y.
Telephone, JUDSON 2-4460

*CQ*—(Title registered U. S. Post Office) is published monthly by Cowan Publishing Corp. Second class postage paid at New York, N. Y. and at Garden City, New York. Subscription Rates: U.S.A. and Possessions, APO, FPO, Canada and Mexico: one year $5.00; two years $9.00; three years $13.00. Pan-American and foreign, one year $6.00; two years $11.00; three years $16.00. Printed in the U.S.A. Entire contents copyright 1962 by Cowan Publishing Corp. *CQ* does not assume responsibility for unsolicited manuscripts. Postmaster: send Form 3579 to *CQ* 300 W. 43rd St., N. Y. 36, N. Y.

## Table of Contents

Packaged Power For Six ....*Irving B. Mickey, W2LCB* 28

The "Silver Sentry" A Super-Stable Variable Frequency Oscillator ....*Hartland B. Smith, W8VVD* 34

Six Weeks In The Sun: FK8, YJ1, FW8, And VR2 *William R. Hempel, VK3AHO* 39

The "Ten-Verter" A 10 Meter Receiver and Converter Tuner .....*John O. Galloup, W8PYQ* 41

The Mark III DX Antenna .....*Paul H. Lee, W3JHR* 43

Three Tubes On Three-Quarter Meters *Frederick W. Brown, W6HPH* 48

An Economy Transistorized Modulator *Vaughn D. Nogle, W5TJT* 51

Shadow Reception .....*Robert E. Kelly, W5CYG* 52

Voice of America Amateur Radio Program ..... 54

The V.H.F. Contest .....*Howard Fruchter, WA2DCM* 55

*The V.H.F. Amateur* ..... 83

Medium Power On 6—Economically *Irwin Math, WA2NDM* 85

Those Auto Connectors *Harvey Hurwitz, WA2HYS* 87

Eliminate Overload! *David L. Heller, K3HNP* 88

A Mobile Call Letter Plaque *Carl A. Schultz, WA2IMG* 90

Commercial Commotion *Roger Crawford, WA6PU* 91

APX-6 Radiators .....*Allen Katz, K2UYH* 91

VHF Balun .....*Irwin Math, WA2NDM* 98

Index To *CQ*, Vol. 18, 1962 ..... 131

## Departments

| | | | |
|---|---|---|---|
| Announcements | 16 | QSL Contest | 20 |
| Contest Calendar | 64 | RTTY | 69 |
| DX | 57 | Sideband | 78 |
| Ham Clinic | 65 | Space Communications | 77 |
| Ham Shop | 122 | USA-CA | 72 |
| Letters | 14 | VHF | 70 |
| Novice | 67 | YL | 81 |
| Propagation | 61 | Zero Bias | 7 |

# SR·150

## Amateur Band Fixed/Mobile Transceiver by

# hallicrafters

5th and Kostner Aves., Chicago 24, Illinois

# All this performance for only $650.00

- Full amateur band coverage—80 through 10 meters
- Receiver AF Gain and RF Gain controls.
- SSB operation—VOX or PTT; CW operation—manual or break-in.
- R.I.T. (Receiver Incremental Tuning)— ± 2 kc adjustment of receiver freq., independent of transmitter.*
- AALC. Hallicrafters' new, exclusive AALC (amplified automatic level control).
- 1650 kc crystal filter.

*Pat. applied for

## SPECIFICATIONS

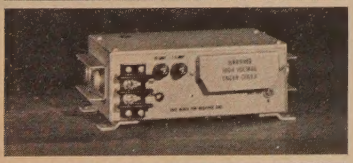
**Frequency coverage:** Eight-band capability — full coverage provided for 80, 40, 20, 15 meters plus one segment of 10M (add'tl. crystals may be added). Available for operation on non-amateur frequencies by special order.

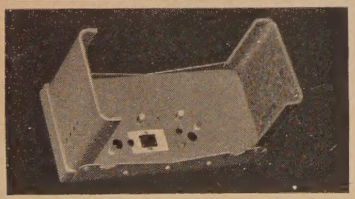
**Front panel controls:** Tuning; Band Selector; Final Tuning; R.F. Level; Mic. Gain; Pre-Selector; R.I.T.; Rec. RF Gain; AF Gain; Operation (Off/Standby/MOX/VOX.); Function (CW/USB/LSB); Cal.

**General:** Dial cal., 5 kc; 100 kc crystal cal.; VFO tunes 500 kc; 18 tubes plus volt. reg., 10 diodes, one varicap. Rugged, lightweight aluminum construction (only 17½ lb.); size — 6½" x 15" x 13".

**Transmitter Section**
(2) 12DQ6B output tubes. Fixed, 50-ohm Pi network. Power input — 150W P.E.P. SSB; 125W CW. Carrier and unwanted SSB suppression 50 db; distortion prod., 30 db. Audio: 400-2800 c.p.s. @ 3 db.

**Receiver Section**
Sensitivity less than 1 μv for 20 db. signal-to-noise ratio. Audio output 2W; overall gain, 1 uv for ½ W output. 6.0 - 6.5 1st I.F. (tunes with VFO). 1650 kc 2nd I.F.





**AC or DC Power Supplies**

**P-150 AC** Styled to match SR-150 Transceiver. Five silicon diode rectifiers, 4" x 6". PM speaker. 22 lb. Size: 6¼" x 7½" x 10". $99.50

**P-150 DC** Five silicon diode rectifiers, four transistors. Weighs only 5½ lb. Size: 3¾" x 10" x 6¼". $109.50

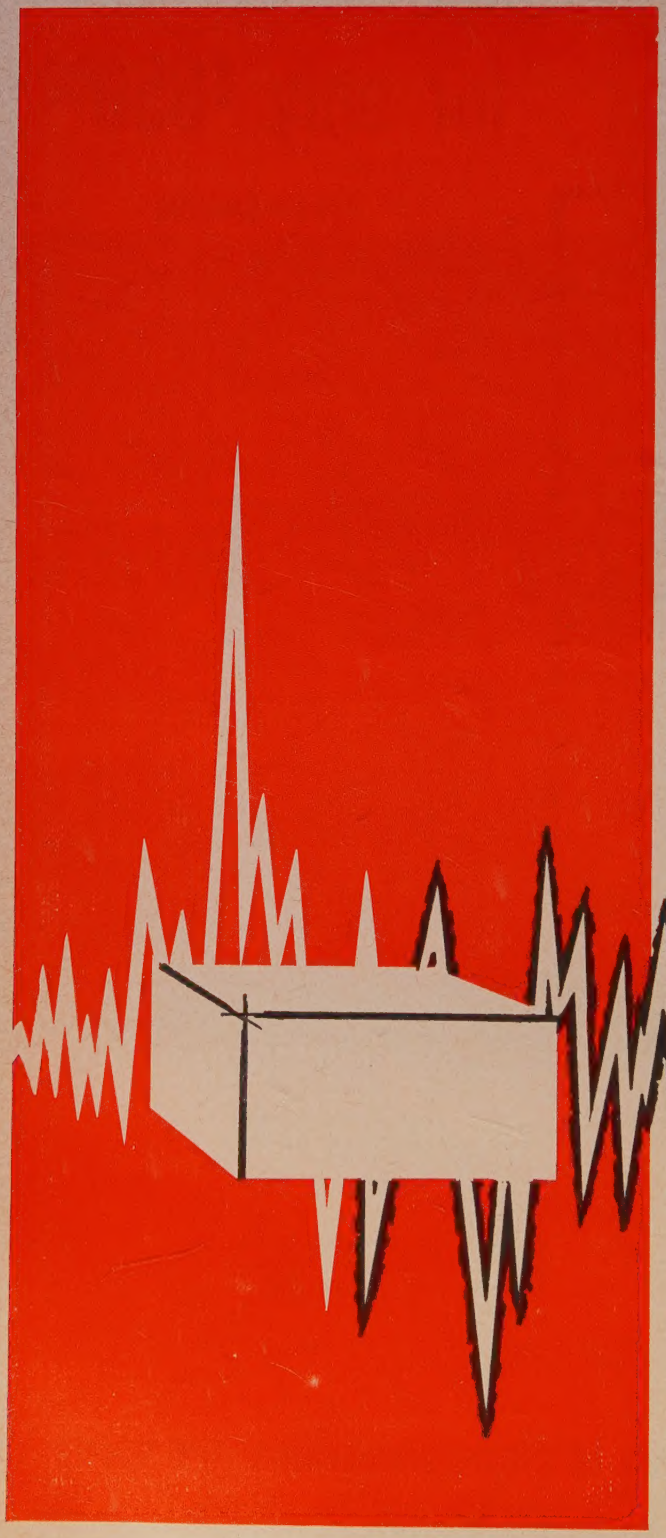
**Complete Mobile Mount**

**MR-150** Adaptable to transmission hump or floor. Quick release design—all connections made simultaneously. Access holes for VOX controls. $39.95.

## where the new ideas in communications are born!

**Overseas sales:** Export Division, Hallicrafters
**Canada:** Gould Sales Co., Montreal, P.Q.

For further information, check number 5, on page 128



SINGLE SIDE BAND TRANSCEIVER. UPPER AND LOWER SIDE BAND OR AM. 20-40-80 METERS. CRYSTAL FILTER. 300 WATTS INPUT. COMPACT. COSTS APPROXIMATELY $300.00. MADE IN U.S.A. BY LEADING ELECTRONICS & HAM EQUIPMENT MANUFACTURER.

**NUFF SAID ?**

For further information, check number 6, on page 128

# ZERO BIAS

W1WY

Wishing

W8ZCV

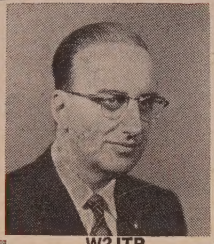
You

K6BX

All

W3ASK

A


W2JTP

Very

W2DEC

Merry

K2MGA

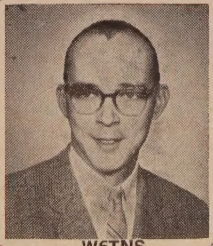
Xmas

W5RZJ

From

W4VZO/HB9

The


W6TNS

Staff

K2MGE

Of

K2HEA

CQ

W2DTJ

Gift Suggestions By **Mosley**

# ANTENNAS AND ACCESSORIES

## Mosley Trapmaster Beams

## Communication Antennas

Streamlined grace combined with the look of rugged strength to make MOSLEY Trap Master Antennas pleasing to the eye and completely acceptable to your neighbors. Trap Master Antennas perform, too . . . thousands of Amateurs in the U.S.A. and almost every corner of the globe-are glad they bought a MOSLEY Trap Master! Illustrated, is the world-famous TA-33. Rated to maximum legal power, this 3 element beam performs wonderfully on 10, 15 and 20 meter bands. Factory pre-tuned for quick easy assembly without tedious measuring.

AMATEUR NET, $99.75 at your favorite amateur equipment dealer.

## Communication Towers

TEN BIG REASONS WHY "TOWERMASTER" BY MOSLEY GIVES THE HAM MORE FOR HIS AMATEUR DOLLAR.

OUTSTANDING ENGINEERING ESPECIALLY DESIGNED WITH THE HAM IN MIND, TO FILL EVERY INSTALLATION REQUIREMENT.

WEATHER RESISTANT WITH YOUR CHOICE OF EPOXY RESIN OR GALVANIZED FINISHES.

ENGINEERING CALCULATIONS AVAILABLE FOR BUILDING AND ERECTION PERMITS WITH PURCHASE OF TOWERS.

RIGID TEN AND TWENTY FOOT SECTIONS, WELDED BY CERTIFIED PERSONNEL.

MANUFACTURED FOR LIGHT WEIGHT OR HEAVY DUTY REQUIREMENTS.

ALL TUBING CONFORMS TO FORMED STEEL INSTITUTE AND CHANNEL BRACING A.S.T.M. STANDARDS.

SELF SUPPORTING TOWERS HAVE HEAVY WALL-HI STRENGTH LEG MEMBERS & HEAVY STEEL CHANNEL BRACING MEMBERS.

THE GUYED TOWER HAS SAFETY CLIPS, LOW FRICTION GUIDES METAL BALL BEARING PULLEYS & GEARED RAISING WINCHES.

EXTRAS INCLUDE, SWING-OVER BASES, MOTORIZED CONTROL AND MANY OTHERS.

REMEMBER THE NAME "TOWERMASTER" FOR A TOWERING SUCCESS

## Communication Receivers

*HERE IS A GIFT IDEA for any amateur radio enthusiast. Mosley's CM-1 Communication Receiver. Outstanding performance in a compact design formerly only available in much higher priced receivers. Priced at only $182.70. For detailed information contact your nearest amateur equipment dealer, or write . . . Mosley Electronics, Inc. . . . 4610 North Lindbergh Blvd., . . . Bridgeton, Missouri*

*Matching Speaker, Model CMS - 1 Net Price $16.95*

Mosley Electronics Inc. 4610 N. LINDBERGH BLVD., BRIDGETON, MISSOURI

For further information, check number 8, on page 128

# your choice of 2 GREAT EICO® TRANSMITTERS...

designed by Hams... for Hams...

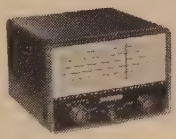
to the highest Ham standards

**90-WATT CW TRANSMITTER* #720**
Kit $79.95 Wired $119.95
*U.S. Pat. #D-184,776
"Top quality"—ELECTRONIC KITS GUIDE
Ideal for veteran or novice. "Clean" 90W CW, 65W AM-phone with EXT plate modulation. 80 through 10 meters.

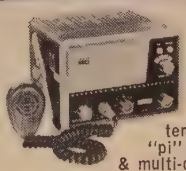
**60-WATT CW TRANSMITTER #723**
Kit $49.95 Wired $79.95
"Compact; well-planned layout. Clean-sounding, absolutely hum-free carrier; stable." — ELECTRONICS WORLD.
Perfect for novice or advanced ham needing low-power standby rig. "Clean" 60W CW, 50W AM-phone with EXT plate modulation. 80 through 10 meters.

**TRANSISTOR CODE PRACTICE OSCILLATOR #706**
Complete with battery
Select variable tone, flashing light, or both together.
Phone jack for private use. Efficient speaker: clean loud signals.
Kit $8.95 Wired $12.95

*New!*



**VARIABLE FREQUENCY OSCILLATOR (SELF-POWERED) #722**
Approaches crystal stability. 80 through 10 meters.
Kit $44.95
Wired $59.95



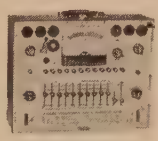
**CITIZENS BAND TRANSCEIVERS 770 Series** U.S. Pat.
Superhet; pre-aligned xmitter osc; match antennas by variable "pi" network. Single & multi-channel models.
From Kit $79.95 Wired $109.95

**HIGH-LEVEL UNIVERSAL MODULATOR-DRIVER #730**
Kit $49.95 Wired $79.95
Delivers 50W undistorted audio for phone operation. Can plate-modulate transmitters having RF inputs up to 100W. Unique over-modulation indicator. Cover E-5 $4.50.

**GRID DIP METER #710**
Kit $29.95 Wired $49.95
Includes complete set of coils for full band coverage. Continuous coverage 400 kc to 250 mc. 500 ua meter.

**PEAK-TO-PEAK VTVM #232** & exclusive *UNI-PROBE® *U. S. Pat.
Kit $29.95
Wired $49.95
**VACUUM TUBE VOLTMETER #221**
Kit $25.95 Wired $39.95

**DC-5MC LAB & TV 5" OSCILLOSCOPE #460**
Kit $79.95
Wired $129.50
**5" GENERAL PURPOSE SCOPE #427**
Kit $69.95 Wired $109.95



**DYNAMIC CONDUCTANCE TUBE & TRANSISTOR TESTER #666**
Kit $69.95 Wired $109.95
**TUBE TESTER #625**
Kit $34.95 Wired $49.95

**RF SIGNAL GENERATOR #324 (150kc-435mc)**
Kit $26.95
Wired $39.95
**TV-FM SWEEP GENERATOR & MARKER #368**
Kit $69.95 Wired $119.95

EICO®
ELECTRONIC INSTRUMENT CO., INC.
3300 NO. BLVD., L.I.C. 1, N. Y.
Export Dept., Roburn Agencies, Inc.
431 Greenwich St., N. Y. 13, N. Y.

EICO, 3300 N. Blvd., L.I.C. 1, N. Y. CQ-12
☐ Send free Catalog & name of neighborhood distributor.
☐ Send free "Short Course for Novice License." ☐ Send 36-page STEREO HI-FI GUIDE: 25c enclosed for postage & handling.
Name.....
Address.....
City..... Zone ..... State.....
Add 5% in the West.

**ENGINEERS:** Excellent career opportunities in creative electronics design. Write to the Chief Engineer.

For further information, check number 9, on page 128

Merry Christmas

FROM THE GANG AT **HAMMARLUND**
MANUFACTURING COMPANY
A Giannini Scientific Company
53 West 23rd Street, New York 10, N.Y.
And Factory, Mars Hill, North Carolina

For further information, check number 10, on page 128

# FREE 1963 INTERNATIONAL CATALOG

*. . . your buying guide for precision radio crystals and quality electronic equipment . . .*

- Transmitters
- Amateur Crystals
- Citizens Band Crystals
- Citizens Band Transceivers
- Converters
- Transistor Subassemblies
- Converters
- Power Supplies
- Antennas
- Oscillators

**AMATEURS • EXPERIMENTERS • CITIZENS LICENSEES**

Mail coupon today for your FREE copy of International's 1963 catalog.

INTERNATIONAL CRYSTAL MFG. CO., INC.

18 NORTH LEE • OKLAHOMA CITY, OKLAHOMA

International Crystal Mfg. Co., Inc. CQ
18 North Lee, Oklahoma City, Okla.
Rush FREE 1963 Catalog.

Name_____
Please Print

Address_____

City_____ Zone____ State_____

For further information, check number 11, on page 128

# Outstanding performance on SSB, AM and CW with absolutely no compromise on any mode

**"SSB ADAPTER"**—Here's the filter-type SSB generator amateur operators everywhere have been asking for! Bandswitching 80 through 10 meters . . . more than 50 db sideband suppression . . . more than 45 db carrier suppression! When used with the Viking "Valiant" or "Valiant II" it places 275 watts P.E.P. at your command—gives you the punch and penetration necessary for solid communications on today's crowded bands!

Two compact units and interconnecting cables . . . RF unit is only 8" wide—may be placed on your operating desk—power supply unit may be placed in any convenient location. Unique design features built-in multiplier requiring VFO input only—band-pass interstage couplers require no tuning—design and front panel layout make operation practically "foolproof"! Superb audio fidelity and balanced audio response; excellent sideband, spurious and carrier suppression. Other features: positive VOX and anti-trip circuits with built-in anti-trip matching transformer and adjustable VOX time delay.

**Cat. No. 240-305-2**—Wired and tested with remote power supply, tubes crystal filter, less microphone. **AMATEUR NET $369.50**

**"VALIANT II"**—Newly restyled, the "Valiant II" giv you outstanding flexibility and performance in a compa desk-top rig! Bandswitching 160 through 10 meters delivers a full 275 watts input CW or SSB (with auxilia SSB exciter or the new Viking SSB Adapter) and 200 wa AM! Low level audio clipping prevents overmodulati and increases modulation level and intelligibility—diffe entially temperature compensated VFO provides the e treme stability necessary for peak SSB operation! Hi efficiency pi-network tank circuit—final tank coil is silv plated. Other features: complete TVI suppression; tim sequence (grid block) keying; high gain push-to-talk aud system built-in low pass audio filter; self-contained pow supply; and single control mode switching.

**AS AN EXCITER**—Drives any of the popular kilowa level tubes, and provides a high quality speech driv system for high powered modulators.

**SSB OPERATION**—Provision for plug-in SSB operatio with no internal modification necessary. Rear panel fittin provided for VFO output and SSB input, connections f remote control of final amplifier bias and VFO keyi through the VOX control of the SSB adapter.

**Cat. No. 240-105-1**—Kit with tubes, less crystals. . . . . **AMATEUR NET $375.0**

**Cat. No. 240-105-2**—Wired and tested with tubes, less crystals. . **Amateur Net $495.00**

## New Catalog

*E. F. Johnson Co. also manufactures other transmitters and accessories . . . all described in our newest amateur catalog. Write for your copy today!*

**E. F. JOHNSON COMPANY**
WASECA, MINNESOTA, U.S.A.

**FACTORY AUTHORIZED SERVICE** Instead of shipping to our factory, equipment to be serviced may also be sent to:

**Electrosony Corp.—Empire State Div.**
65-37 Queens Blvd.
Woodside 77, New York

**Park-Armature Co.**
1218 Columbus Ave.
Boston 20, Mass.

**Heights Electronics, Inc.**
1145 Halsted Street
Chicago Heights, Ill.

**B and S Electronics, Inc.**
6326 W. Roosevelt Rd.
Oak Park, Ill.

**Radio Comm and En**
Pinehurst Place
Charlotte 9, N. C.

For further information, check number 12, on page 128

# What Job Do You Want In Electronics?

## Whatever it is, Cleveland Institute can help you get it!

Yes, whatever your goal is in Electronics, there's a Cleveland Institute program to help you reach it *quickly* and *economically*. Here's how: Each CIE program concentrates on electronics theory as applied to the solution of practical, everyday problems. Result . . . as a Cleveland Institute student you will not only learn electronics but *develop the ability to use it!* This ability makes you eligible for any of the thousands of challenging, high-paying jobs in Electronics. Before you turn this page, select a program to suit your career objective. Then, mark your selection on the coupon below and mail it to us *today*. We will send you the complete details . . . without obligation . . . if you will act NOW!

### Electronics Technology

A comprehensive program covering Automation, Communications, Computers, Industrial Controls, Television, Transistors, and preparation for a 1st Class FCC License.

### First Class FCC License

If you want a 1st Class FCC ticket quickly, this streamlined program will do the trick and enable you to maintain and service all types of transmitting equipment.

### Industrial Electronics & Automation

This exciting program includes many important subjects as Computers, Electronic Heating and Welding, Industrial Controls, Servomechanisms, and Solid State Devices.

### Electronic Communications

Mobile Radio, Microwave, and 2nd Class FCC preparation are just a few of the topics covered in this "compact" program . . Carrier Telephony too, if you so desire.

### Broadcast Engineering

Here's an excellent studio engineering program which will get you a 1st Class FCC License and teach you all about Program Transmission and Broadcast Transmitters.

## Cleveland Institute of Electronics

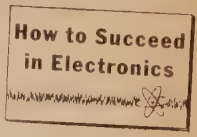
1776 E. 17th St., Dept. CQ-95
Cleveland 14, Ohio

Accredited Member

### Mail Coupon TODAY For FREE Catalog

**Cleveland Institute of Electronics**
1776 E. 17th St., Dept. CQ95
Cleveland 14, Ohio

Please send FREE Career Information prepared to help me get ahead in Electronics, without further obligation.




CHECK AREA OF MOST INTEREST –

- ☐ Electronics Technology
- ☐ Industrial Electronics
- ☐ Broadcast Engineering
- ☐ First-Class FCC License
- ☐ Electronic Communications
- ☐ _____ other

Your present occupation_____

Name_____ Age___
(please print)

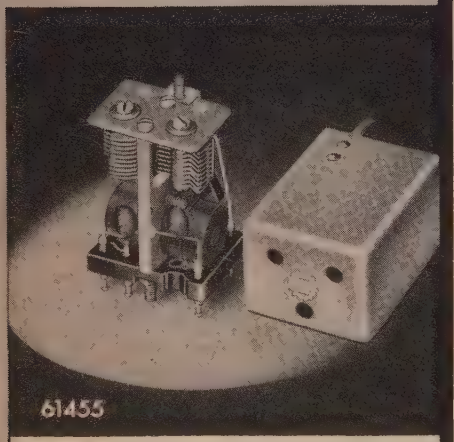
Address_____

City_____ Zone___ State_____

CQ95

Designed for

Application



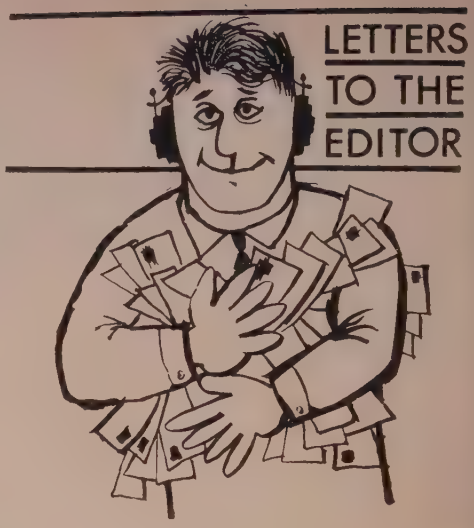

**The No. 61455**

**ADJUSTABLE COUPLING—HIGH Q MINIATURE IF TRANSFORMER**

Extremely high Q: Variable Coupling—(under, critical, and over) with all adjustments on top. Small size 1 1/16" x 1 1/16" x 1 7/8". Molded terminal base. Air capacitor tuned. Coils mounted in special powdered iron assemblies. Tapped primary and secondary. Rugged construction. High electrical stability. No. 61455, 455 kc universal transformer. No. 61453, 455 kc. BFO. No. 61160, 1600 kc. transformer and No. 61163, 1600 kc. BFO.

**JAMES MILLEN MFG. CO., INC.**

MAIN OFFICE AND FACTORY
MALDEN
MASSACHUSETTS




### Think — Act!

Editor, *CQ*:

In reply to the Lorentz's letter regarding transistor s.s.b. equipment (LETTERS, Sept. *CQ*) I would like to present the following observations.

It seems to me that if a person has sufficient interest and desire for something, he should be willing to do a little work for it. If Mr. Lorentz really wants the transistor gear that he has been searching for," he should make some attempt to design it himself. There are a number of good books available, and after studying these, in conjunction with a little experimentation, I believe that almost anyone could come up with a design suiting his needs. The knowledge and experience thus gained would easily be worth the trouble.

Also, one of the principles upon which the amateur radio service was established was the condition that the amateur advance his skills in both the communications and technical phases of the art.

It is hoped that this reminder will motivate all who read this to do some original and constructive thinking, as well as acting.

Arthur Carter Cogle, K4ARO
1667 Varina Avenue
Petersburg, Va.

### Stick In The Mud

Editor, *CQ*:

In reference to the F.C.C. officer (ZERO BIAS, Oct.) who regards the low level of conversation of some amateur operators as just cause for reallocation of part of the ham bands to other services; then proceeding on the basis of this reasoning I believe that some other shifts on the spectrum should be made.

Although a few amateur operators are on a par with Paar, and others among us have no more reason than Gleason, these few amateurs are more than offset by the technological and sociological attainments of the remaining multitude of amateurs, some of whom can orbit in a rarified intellectual atmosphere that would not let the earthly trivialities and inanities of Paar, also Gleason, tolerated by the F.C.C. on b.c. and TV programs, get off the earthly mud in which they are stuck.

Therefore, not until Paar and Gleason, also some other b.c. and TV characters are relegated and confined to citizens band should amateurs loose any more band space.

Homer Shatto, W8PXH
P. O. Box 88
Ashtabula, Ohio

← For further information, check number 14, on page 128

# The ideal Christmas gift for any ham

(or for his xyl!)

*Season's Greetings*

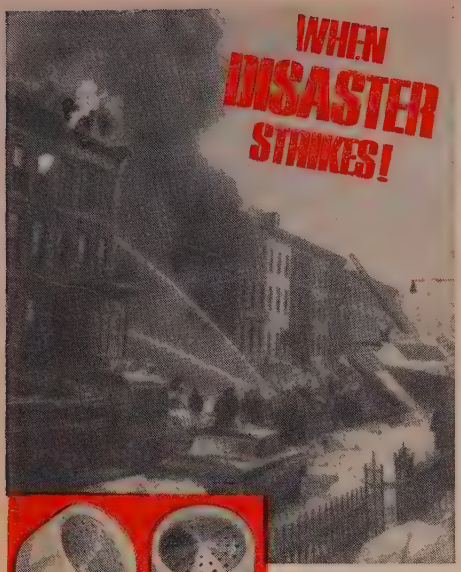
from the people who make the

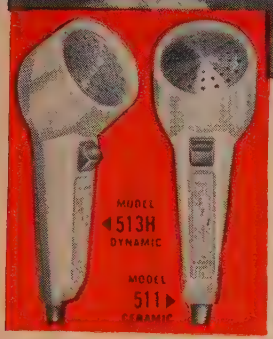
**DRAKE 2-B RECEIVER**

R. L. DRAKE COMPANY
Miamisburg, Ohio

| | |
|---|---|
| W8CYE | *"Bob" Drake* |
| W8NGU | *"Piff" Smith* |
| K8IMN | *"Bill" Drayer* |
| W8VST | *"Vic" Blackwell* |
| K8YDO | *"Milt" Sullivan* |
| W8NUQ | *"Jim" Waits* |
| K8HYD | *"Jim" Kittel* |
| K8JYP | *"Ernie" Gulden* |
| K8HGI | *"Carl" Wolfe* |
| WA8CKE | *"Bob" Brandt* |
| W8ENH | *"Clem" Wolford* |

For further information, check number 15, on page 128




**NEW YORK, Dec. 16**
Firemen pour water into burning apartment house set afire by the crash of a jet liner in Brooklyn. (AP Wirephoto ®)

**Model 513H**
**List . . . $34.50**

**Model 511**
**List . . . $19.95**

When the need is urgent — instan — you can depend on Astatic Mobile Microphones to immediately establish lines of communication and *keep them open* unfailingly. Here is dependable contact, at your fingertips, when you need it most.

ASTATIC **Mobile Microphones**

Afloat or ashore, aloft or aground in automobile, boat, plane or motorcycle, you're in touch instantly because Astatic Mobile Microphones deliver:

- **High Reliability**
  — *they work under the most extreme conditions*
- **Intelligibility**
  — *you can hear and be heard clearly, understandably.*
- **Useability**
  — *designed and proportioned to fit the user and the use.*
- **Availability**
  — *with an efficient bracket to hold microphone off the floor, ready for use now!*

Write for Astatic Data Bulletin #511 and #513H.

THE ASTATIC CORP.
CONNEAUT, OHIO • U.S.A.
IN CANADA: Canadian Astatic Ltd., Toronto
EXPORT: Roburn Agencies, N. Y. 13, N. Y.
MANUFACTURERS OF
PHONOGRAPH CARTRIDGES • NEEDLES
• PICKUPS • MICROPHONES • RECORDING TAPE

For further information, check number 16, on page 128

Editor, *CQ*:

Congratulations on your Editorial in the October issue! It directly points out the factors that, if changed, can save amateur radio; or, if allowed to go as they are, can spell the doom of our hobby. I wish every radio amateur would read and heed!

Carl C. Drumeller, W5EHC
5824 N. W. 58th Street
Oklahoma City 22, Okla.

### What's That?

Editor, *CQ*:

How about some articles about uses for Conelrad Monitors? —*Joe Routh, W4GPE*

### "A-1 Op"

Editor, *CQ*:

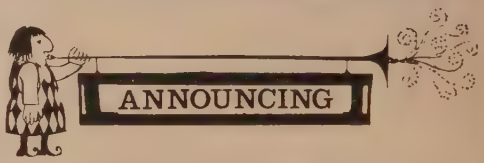
I would like to propose a new type of certificate to be issued to any radio amateur that can meet the following qualifications for his station:

1. Antenna switch or relay to change from antenna to dummy load for tuning, testing, or zeroing on frequency. 2. Simple scope for viewing output of transmitter with any type of transmission. 3. Simple means of listening or monitoring own transmission for test purposes. 4. Secondary means of checking receiver calibration using a crystal oscillator that has, and can be checked with the WWV.

Qualifications for the above to be attested to by two licensed radio amateurs, General class or higher, that have visited the station of the amateur applying for certificate.

It is assumed that any well operated station will comply if the means outlined above is readily available.

R. A. Prehm, W7ZEV
4629 S. 166th St.
Seattle 88, Wash.




### New York

The Westchester Amateur Radio Association will sponsor its Christmas Dinner on December 20th to be held at the Cabin Restaurant, 1172 Knollwood Road, White Plains, N. Y. Mort Kahn, W2KR, Hudson Division Director will be guest speaker. Tickets go for $5.00 and may be obtained from WA2NRV, 247 No. Regent St., Port Chester, N. Y

### San Francisco

The San Francisco Radio Club, Inc., is holding its Annual Christmas Banquet at the Westlake Bowl, Daly City, California. The date is Saturday, December 15th. More information may be obtained by writing the club at 1660 Pine St., San Francisco 9.

### Alaska

While we sit cozy at our firesides the Arctic Amateur Radio Club plans their Winter Field Day! They'll be on all bands, a.m., s.s.b. and c.w., Dec. 29 and 30. QSLs guaranteed. Herb Loree, KL7EEH will fill you in via P. O. Box 389, College, Alaska.

### California DX

The annual joint meeting of the Northern California DX Club and Southern California DX Club will be held 26-27 January at the Continental Wayside Inn, Paso Robles, California, located half way between Los Angeles and San Francisco on Highway 101. Most of the top DXers of California will be there and talks, and other presentations by leading DX operators are scheduled. All hams with an interest in DX are invited. Registration prior to 12 January is $7.00. Registration at the meeting is $7.50. Registration fee includes Saturday night banquet and Sunday morning breakfast. Send registration fee, and address all inquiries to W6KG, 111 Purdue Ave., Berkeley 8, California.

# cific Plantronics now offers to the Amateur Radio Operator...

## is a Miniature Boom-Microphone Headset Combination

It is the smallest such device in the world . . . . . 2/3 oz.
It has flown the fastest . . . . . 17,560 mph. (see below*)
It has flown the highest . . . . . 176 mi. (see below*)
It is the MOST in sophisticated communications devices in the world for the money.

**S-20 . . . . $32.50** Microphone only
**S-30 . . . . $47.00** Microphone & Receiver

Price includes 1 oz. headband for optional wearing

**Development of:**

Pacific Plantronics MS-41 (standard in the Project MA-8 Mercury Astronauts' space suits)

Pacific Plantronics MS-50 (Soon to be standard on United Air Lines jet fleet)

Dealer Inquiries Invited

(Pat. Appl. for)

**PACIFIC PLANTRONICS, INC.**
P. O. Box 604 • Santa Cruz, Calif. • GA 6-5858

**Voice Engineered Freq. Response:**

Nominal 280 — 4200 cps ± 6 db

- 3,000 Ω impedence, microphone
  600 Ω impedence, receiver
- 49 dbm at normal speech level

**PACIFIC PLANTRONICS, INC.**
P. O. Box 604 • Santa Cruz, Calif. • GA 6-5858

Gentlemen: Please send me Air Mail prepaid

_____ MS-30 Headsets . . . . . @ $47.00
_____ MS-20 Microphones . . . @ $32.50

I am enclosing my check for_____ in payment (please add 4% sales tax to California orders)

Name_____

Address_____

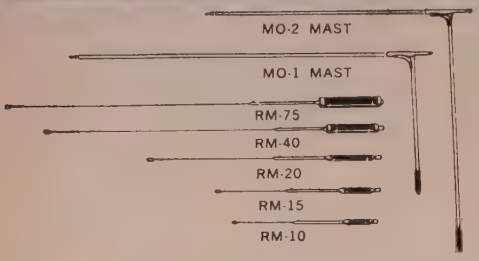
City_____ State_____

For further information, check number 7, on page 128

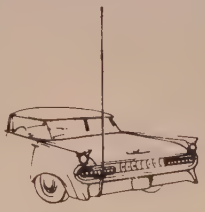
# GOOD MOBILES GO

# HUSTLER

## MOBILE ANTENNA
## 10-15-20-40-75-METERS




Buy only the mast and resonators for the bands you operate. NO NEED FOR MATCHING DEVICES, NO FEED LINE LENGTH PROBLEMS. Use any length of 52 ohm cable. New, efficient concept of center loading. Each resonator has a coil specially designed for maximum radiation for a particular band. Center frequency tuning is by an adjustable stainless rod in the resonator. The fold-over aluminum mast permits instant interchange of resonators. Mast folds over for garage storage. Mast has 3/8-24 base stud to fit standard mobile mounts, but will perform better with New - Tronic mounts. Power rating is 75 watts dc input A.M. - 250 watts PEP input for SSB.



Mast and resonator in mobiling position

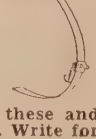
Mast and resonator folded over

**RESONATOR WILL WORK PROPERLY ONLY IF USED WITH MO-1 OR MO-2 MASTS. ANTENNA ASSEMBLY CONSISTS OF 1 MAST and 1 RESONATOR.**

| MODEL | DESCRIPTION | TOT. HGT. of ASSY. | NET |
|---|---|---|---|
| MO- 1 | 54" mast folds at 15" fr. base | Rear deck or fender | $ 7.95 |
| MO- 2 | 54" mast folds at 27" fr. base | Bumper | 7.95 |
| RM-10 | 10 meter resonator | 80" max. - 75" min. | 5.95 |
| RM-15 | 15 meter resonator | 81" max. - 76" min. | 6.95 |
| RM-20 | 20 meter resonator | 83" max. - 78" min. | 7.95 |
| RM-40 | 40 meter resonator | 92" max. - 87" min. | 9.95 |
| RM-75 | 75 meter resonator | 97" max. - 91" min. | 11.95 |

**ANY MAST OR RESONATOR MAY BE PURCHASED SEPARATELY**

## MODEL BM-1 BUMPER MOUNT



Flat alloy steel strap fits any shape bumper, large or small. "J" bolts require only ¼" clearance between top of bumper and car body. Heavily chrome plated 1½" die cast Zamak ball has ⅜"-24 thread. Adjustable for true vertical position. Gray Cycolac base. Heavily cadmium plated....$6.95

**Ask your distributor to show you these and other fine NEW-TRONICS products. Write for literature on the complete NEW-TRONICS line.**

**NEW-TRONICS CORP.**
3455 Vega Avenue Cleveland 13, Ohio

For further information, check number 18, on page 128


### Can You Help???

AS FAR as we can ascertain, radio amateurs in the Soviet Union are the only group that can, in *no way*, exchange their money for American dollars, and because of this, lose out each month in their ability to receive *CQ*. Soviet amateurs are extremely interested in receiving American publications and *CQ*, with the help of the International Ham-Hop Club, is instituting a method, whereby American amateurs can offer subscriptions to Russian radio amateurs at a considerable reduction over the normal rate.

Interested amateurs should write R. L. Gunther, W6THN/1, the North American representative of the I.H.H.C. enclosing their check or money order for $8.00 in payment for two one-year subscriptions for *two individual* amateurs or $8.00 for one two-year subscription for a *single* radio amateur. Please *do not* write *CQ!*

You may, or may not specify the recipient. In either case, gift cards and envelopes, together with name and address of the Russian radio amateurs will be sent to the donor.

The North American Division of the I.H.H.C. is handling the paper-work without remuneration.

We hope you feel, as we do, that American publications are sorely needed in the U.S.S.R. and this is our way of tightening the bonds of amateur friendship. We hope it is successful! Lee's address is:

R. L. GUNTHER, W6THN/1
c/o Biology Department
Brown University
Providence 12, Rhode Island

### Directories

W4RLS, tells us that he has two very interesting Directories being compiled. One is a list of amateurs who are members of the Church of Christ and the other lists attorneys who are amateurs. Both are brought up-to-date every year and are available for a self-addressed stamped envelope. Foy's address is 500 North Jackson Ave., Russellville, Alabama.

### ROAR

"Rotarians of Amateur Radio" loosely encompasses a club of radio amateurs who are also Rotary members. Byron Sharpe, W9JKC brings this list up-to-date annually and it's mailed out as a Christmas card to all on the list. If you're a Rotarian let Byron know and you'll be put on the list.

### Florida

January 19th and 20th, 1963 is the date; Bayfront Park Auditorium at 5th Street and Biscayne Blvd., Miami, Florida is the place; and the event is the famous "Tropical Hamboree." Next month the Dade County Radio Club and the Southeastern Division A.R.R.L. Convention combine to make this one the biggest and best in the South. The day after the convention the club hopes to arrange a special airplane trip to VP7, leaving Monday morning and returning in the evening. Special rates are also available for hotels, etc. All information may be obtained from the Convention Chairman, Dade Radio Club, Box 104, Miami 1, Florida.

### Corrections

W4ZBQ notes that a few points were omitted in an article entitled "A $5.00 Frequency Standard, "September, 1962, page 32. Some units do not have access holes for frequency adjustment thus the base must be unsoldered.

Units with serial numbers fro 2456 through 5602 have a different circuit.

Some of the ovens may not operate at 6 volts but at 24 volts. Some units, serial 1558, have the BM-100 oven but numbers 2456 and 5602 have Bulova AB-200 ovens. The oven heater takes 0.45 amperes at 24

[*Continued on page 101*]

# VE BEAM PENTODES FOR S.S.B.

f you plan to build a new single-sideband ar amplifier and want it to be the ultimate in lity—or if you're dissatisfied with the per- mance of your present tetrode linear amplifier hen you'll be interested in these five beam todes from Penta Laboratories, Inc.

The suppressor grid is the secret of beam pen- e performance. In the 1000-watt PL-8295 rmerly PL-172), the 400-watt PL-175A, or the watt PL-177A and PL-177WA, Penta's exclu- e, patented vane-type suppressor grid provides ellent beam tube performance with the sup- ssor grid operated at ground potential. Better- n-tetrode performance is also achieved with 125-watt PL-4E27A, which uses a conven- al suppressor grid. The longer plate voltage swing which can be obtained at a given screen voltage is the direct result of the electron beaming due to use of the suppressor, and leads to increased linearity, efficiency, and output.

If you're contemplating mobile operation, consider the Penta PL-177WA beam pentode—the directly interchangeable, ruggedized version of the popular PL-177A. You can mount the PL-177WA in any position, and subject it to grueling shock and vibration with no worry about shortened tube life.

Building, modifying, or buying a linear amplifier, look to Penta beam pentodes. They're your key to the ultimate in linear amplifier performance. Write today for your free copies of Penta beam pentode data sheets.

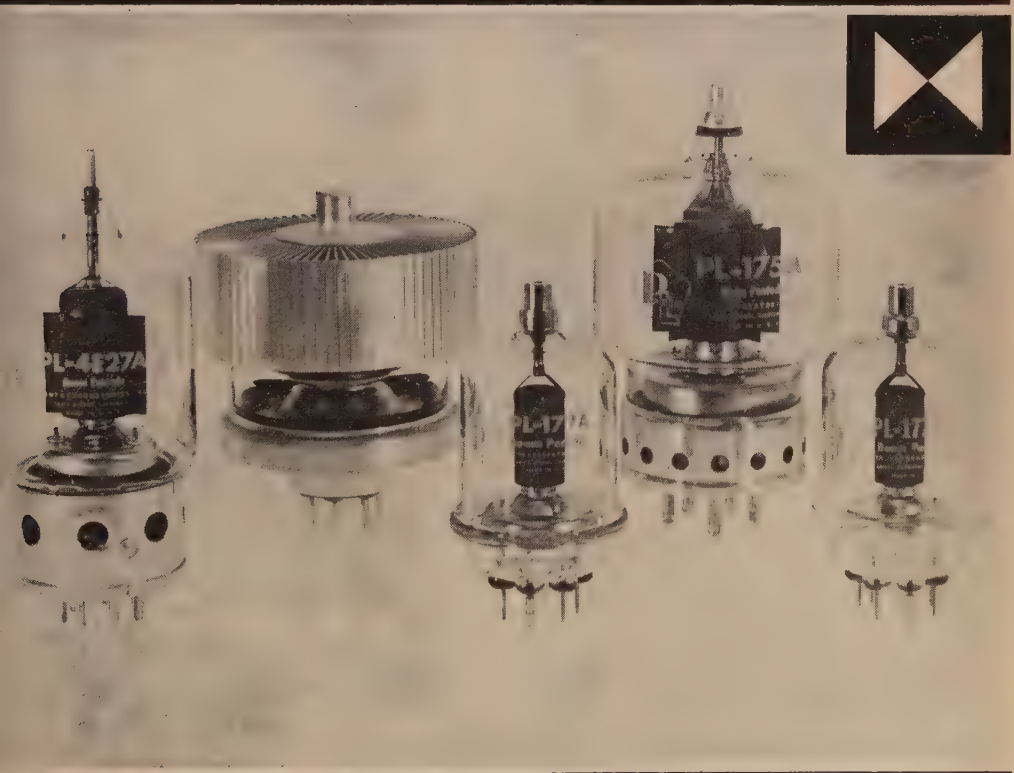
RATINGS

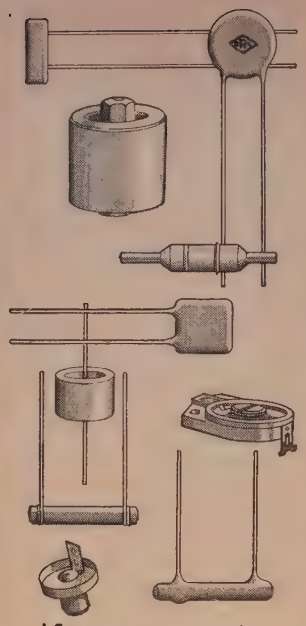
| Type | FILAMENT Voltage (Volts) | FILAMENT Current (Amps) | Max. Plate Dissipation (Watts) | USEFUL OUTPUT* CLASS-AB$_1$ LINEAR AMPLIFIER Plate voltage in volts 1000 | 1500 | 2000 | 2500 | 3000 |
|---|---|---|---|---|---|---|---|---|
| -177A, PL-177WA | 6.0 | 3.2 | 75 | 96W | 140W | 210W | — | — |
| -4E27A | 5.0 | 7.5 | 125 | — | — | 220W | 280W | — |
| -175A | 5.0 | 14.5 | 400 | — | — | 445W | 570W | 680W |
| -8295 | 6.0 | 8.2 | 1000 | — | — | 1040W | 1260W | 1590W |

tual power output delivered to load from typical amplifier.

## ENTA LABORATORIES, INC.

312 North Nopal Street
Santa Barbara, California





If you need a
Ceramic
Capacitor
**Centralab**
has it!

As the pioneer in the development and production of ceramic capacitors, Centralab has the industry's most complete line... and is your best source for ceramic transmitting capacitors!

No matter what your requirements—discs, tubulars, buffers, trimmers, feed-thrus, high voltage, low voltage—Centralab makes them, and makes them best.

Whether you need one capacitor or one thousand, your nearby Centralab distributor can supply them—probably right from his complete stocks.

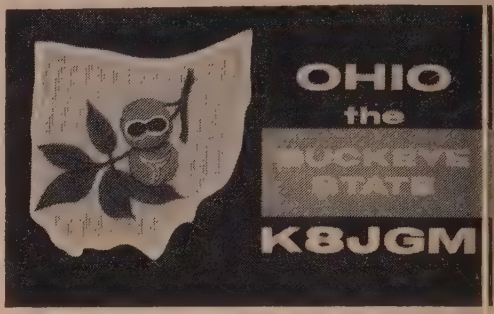
For the complete list of stock capacitors, ask your distributor for Catalog 31, or write for your free copy. D-6136

**Centralab**

THE ELECTRONICS DIVISION OF GLOBE-UNION INC.
954M EAST KEEFE AVENUE · MILWAUKEE 1, WISCONSIN
In Canada: Centralab Canada Ltd.,
P.O. Box 400, Ajax, Ontario

For further information, check number 17, on page 128

# QSL contes



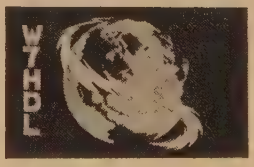

WINNER this month is Lee Belhorn, K8JGM with an interesting card using three colors, giving a four-color effect. Lee, of course, is emphasizing his State.

Next in line are WA6ILY, W7HDL and VU2BG. If you're a phone man you may not recognize Dan's card.

Other cards received that deserve mention are: WA2UUT, K3MKW, W5GKK, K7PWY, K8ZQE, and UR2GK.

The QSL Card editor would like to emphasize that commercial multi-color post cards, surprinted with call, *etc.*, do not qualify. One-of-a-kind cards, too, are not eligible. Winners receive a one year extension of their subscription.

## Runners Up



BUY THE FINEST TOWER MADE — BUY TRI-EX!
THERE IS A TRI-EX TOWER TO FIT YOUR ANTENNA REQUIREMENTS

Tri-Ex

Tri-Ex

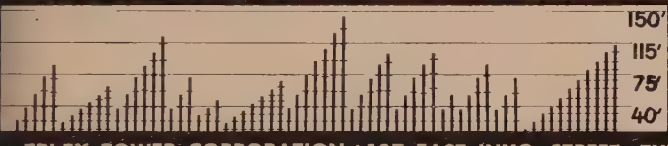
NOW! NEW LOWER PRICES ON ALL GUYED TOWERS!

EXAMPLE: TRI-EX H AND HS SERIES GUYED TOWERS WITHSTAND HEAVY WIND LOADS WITH REALLY BIG ANTENNAS TOPSIDE!

- IRON PHOSPHATE RUST PROOF UNDERCOATING PLUS EPOXY RESIN PRIMER AND BAKED ENAMEL FINISH COAT (GALVANIZED AT SLIGHTLY HIGHER COST)
- ACCOMMODATES ALL PROP PITCH AND OTHER ROTOR MOTORS INSIDE TOP SECTION
- HEAVY DUTY CRANK-UP EQUIPMENT

| MODEL NO. | HEIGHT (ft.) | WEIGHT (lbs.) | NEW LOW PRICE |
|---|---|---|---|
| H-237 | 37 | 150 | $140.00 |
| H-354 | 54 | 250 | 190.00 |
| H-471 | 71 | 365 | 270.00 |
| HS-237 | 37 | 200 | 175.00 |
| HS-354 | 54 | 305 | 240.00 |
| HS-471 | 71 | 440 | 343.00 |
| HS-588 | 88 | 620 | 475.00 |
| HS-6105 | 105 | 870 | 745.00 |

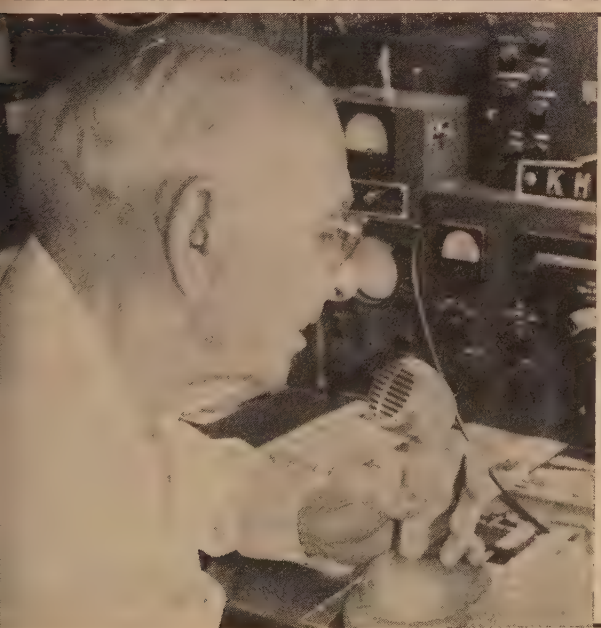
GUY CABLE, PLATES, CLAMPS, ANCHORS, ETC. AVAILABLE IN KIT FORM AT LOW ADDITIONAL COST.




SEND FOR THE NEW TRI-EX ANTENNA TOWER SELECTOR CHART

TRI-EX TOWER CORPORATION / 127 EAST INYO STREET / TULARE / CALIFORNIA / MU 6-3411

For further information, check number 20, on page 128



KH6AR
Wahiawa, Oahu, Hawaii
reports:

"most natural sounding SSB mike yet"

We'll let Ken Bryan's (KH6AR) letter to us speak for itself:

"I've been using my Shure 440SL on regular skeds with people who know my voice from eyeball QSO. That includes my daughter who doesn't ordinarily like the tone of sideband. Everybody tells me that it's the most natural sounding SSB mike yet . . . especially my daughter.

"The pick-up is great. The tendency of local splatter and unwanted sideband is *considerably* reduced over three other mikes I compared it with. Humidity doesn't affect it at all. All in all, I feel it's the best SSB mike I've ever had, including one that cost me over $50.00!"

ONLY $28.50 net

*(complete with stand, grip-to-talk switch, 7 ft. highest quality 2 conductor shielded cable.)*

**A87K Modification Kit.** *Instant switching from VOX (with muted microphone position) to push-to-talk. $3.25 net.*

SHURE 440SL

CONTROLLED MAGNETIC SSB, AM, FM MICROPHONE

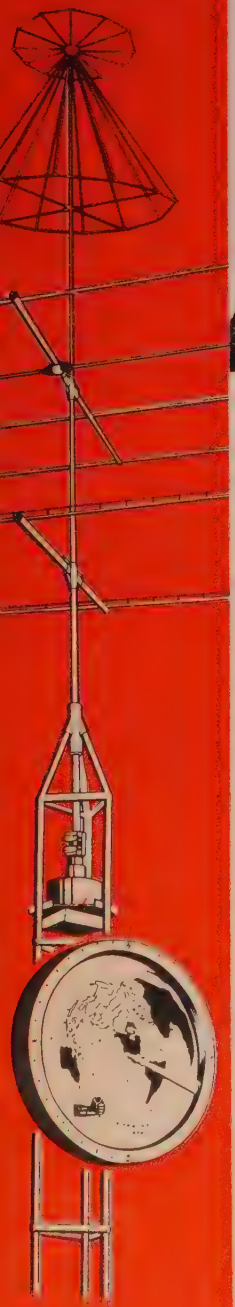
*Literature: Shure Brothers, Inc., 222 Hartrey Ave., Evanston, Illinois*

For further information, check number 21, on page 128

# WIN this complete hy-gain ANTENNA SYSTEM

WITH 56 foot Spaulding Tower

**WORTH OVER $500.00**
**or one of 24 other valuable prizes**



IN HY-GAIN's SECOND ANNUAL

# Skyhook II CONTEST

**Contest open to any Licensed Amateur* on Planet Earth. • All entries must be postmarked no later than 23:30 GMT, 31 December 1962**

## NOTHING TO BUY...

Here's all you have to do—

Simply pick up an Official Skyhook II Entry Blank from your favorite Hy-Gain distributor and, in twenty-five words or less, complete the following statement: "If I were the New Product Manager of Hy-Gain, I'd ask my engineering department to develop an antenna design that would *(25 words or less)*." Send your entry to Hy-Gain Antenna Products, NE Highway 6 and Stevens Creek, Lincoln, Nebraska. All entries will be judged on the contribution the suggestion offered will make toward universally improving reception or transmission and will remain the property of Hy-Gain Antenna Products, Inc.

**FIRST PRIZE...** 3.5–500 MC including RBX-1 Rotator and Directional Indicator, DS-1 Discone with range of 50 thru 500 mc., TH-4 Tribander, 402-B 40 Meter Monobander, 2BDP Multiband Doublet and 56' Spaulding Tower.

**2nd PRIZE** DB-24 Duobander, 20-40 meters
**3rd PRIZE** 18HT All Band Vertical
**4th PRIZE** TH-4 Thunderbird Tribander
**5th PRIZE** TH-3 Thunderbird Tribander

*Sorry, we must exclude entries from Cities, States or Countries where contests are prohibited by law.

**BE A WINNER!** Pick up an Official Entry Blank TODAY and submit your suggestion NOW to:

hy-gain ANTENNA PRODUCTS
8403 NE Highway 6 and Stevens Creek
LINCOLN, NEBRASKA

# SKYHOOK CONTROL CENTER

offering World's Most Popular Amateur Antennas

**ALABAMA**
**Birmingham** – ACK Radio Supply Co., 3101 Fourth Ave., South
**Huntsville** Curle Radio Supply, 106 Winston A

**ARIZONA**
**Phoenix** – Southwest Electronics Devices, 129 East Jefferson, P. O. Box 3751
**Tucson** Elliott Electronics, Inc., 418 No. Fourth

**ARKANSAS**
**Dewitt** Horsetrader "Ed" Morry Wholesale Radio 12th & Jefferson

**CALIFORNIA**
**Anaheim** – Henry Radio, 931 N. Euclid Ave
**Buena Park** – S. J. Radio Electronics Co., 6306 B
**Burbank** – Valley Electronics, 1302 W. Magnolia
**Burlingame** – Amrad Supply, Inc., 999 Howard A
**Goleta** Dow Electronics of Goleta, 5857 Hollist
**Hemet** – Gil Severns Wholesale Electronics, 40400 East Florida
**Inglewood** – Acorn Radio, 4736 W. Century Blvd
**Long Beach** – Scott Radio Supply, 266 Alamitos
**West Los Angeles** – California Electronics Supply 11201 West Pico Blvd
**Los Angeles** – Federated Purchaser, Inc., 11275 W Olympic Blvd
Henry Radio, 11240 West Olympic Blvd
Radio Products Sales Co, 1501 South Hill
**North Hollywood** – Arrow Electronics, 7035 Laurel Canyon Road
**Oakland** – Elmar Electronics, Inc., 140 11th St
**Oxnard** – Dow Electronics, 1505 South Oxnard Bl
**Palo Alto** – Zack Electronics, 654 High St
**Pasadena** – Arrow Electronics, Inc., 2650 E Cole
Dow Radio, 1759 E. Colorado Blvd
**Riverside** – Mission Ham Supplies, 5474 Mission
**Sacramento** – Selectronics, 4113 Franklin Blvd
**San Diego** – Western Radio & TV Supply, 1415 Ir
**San Francisco** – Amrad Supply, Inc., 3425 Balbo
San Francisco Radio & Supply, 1284 Market S
Zack Electronics, 1422 Market St.
**San Jose** – Quement Industrial Electronics, 161 West San Fernando Ave
**Santa Ana** – Arrow Electronics, Inc., 2713 South
**Santa Maria** – Dow Electronics of Santa Maria, 222 West Main St
**Vallejo** – Electronics' Best Buys, 1219 Monterey
**Van Nuys** – Valley Electronics, 17647 Sherman W

**COLORADO**
**Denver** – Radio Products Sales Company, 1237

**CONNECTICUT**
**Hartford** – Hatry of Hartford, 100 High St
**West Hartford** – Radio Shack Corporation, 39 South Main St
**New Haven** – Radio Shack Corporation, 230 234 Crown St
**New London** – Aikins Electronic Supplies, 531 B
**Norwalk** – Arrow Electronics
**Stamford** – Radio Shack Corporation

**WASHINGTON D. C.**
Electronic Wholesalers, Inc., 2345 Sherman Ave.,

**DELAWARE**
**Wilmington** – Almo Radio Company, 1122 French

**FLORIDA**
**Jacksonville** – Kinkade Radio Supply, 1354 Laur
**Melbourne** – Electronic Wholesalers, 1301 Hibiscus Boulevard
**Miami** – Amateur Radio Center, Inc., 2805 N.E. Se
Electronic Wholesalers, 9390 N.W. 27th Ave.
**Orlando** – Amateur Electronics Supply, 23 Azalea Park Shopping Center
**Tampa** – Kinkade Radio Supply, 1719 Grand Cent

**GEORGIA**
**Dalton** – Curle Radio Supply Company, 710 North Hamilton

**HAWAII**
**Honolulu** – Honolulu Electronics, 819 Keeaumoku

**ILLINOIS**
**Alton** – Ebinger Radio, Inc., 1022 East Broadway
**Benton** – Lampley Radio Company, 452 E. Church
**Chicago** – Allied Radio Corp., 111 N. Campbell
Amateur Electronics Supply, 6450 Milwaukee A
Newark Electronics, 223 W. Madison St.
**Chicago Heights** – Heights Electronics, Inc., 1145 Halsted Street

rg Knox Electronic Supply, Inc.,
North Cherry St.
Crawford Electronics, 233 W. Main St.
Klaus Radio & Electronics, 1055 First St.
d – Allied Radio Corporation, 2200 Maywood Drive
Selectronics Supplies, Inc.,
03 S. W. Adams St.
Radio & Electronics, 403 E. Lake
rest - Trigger, 7361 W. North Ave.
d H & H Electronic Supply, Inc.,
510 Kishwaukee St.
eld Bruce Electronics, 1120 E. Capitol Ave.

**HA**

le Castrups, 1014 W. Franklin St.
te Amateur Supply, 8 East Iowa St.
yne Ft. Wayne Electronics Supply, Inc.,
5 E Maumee Rd.
a Radio Company, 1716 S. Harrison St.
polis Brown Distributing Co., 3746 College Ave.
n Electronics Supply, Inc., 122 S. Senate Ave.
ckle Radio Supply Co., 4131 N. Keystone Ave.
nville – Moakler Electronic Supplies,
E Chestnut St.
e Lafayette Radio Supply Co., Inc.,
408 E. North St.
Muncie Electronics Supply, Inc.,
N Madison Ave
end Radio Distributing Co., 1212 High St.
Company, Inc., 747 South Michigan St.
aute C. T. Evinger Company, 1216 Wabash Ave.
Haute Radio Company, 501 Ohio St.

apids Iowa Radio Supply Co., Inc.,
Center Point Rd., N. E.
Bluffs World Radio Labs.,
27 W. Broadway
nes Radio Trade Supply Co., 1224 Grand Ave.
ur Radio Center, 1214 Grand Ave.

**AS**

Electronics, Inc., 227 North Santa Fe
Amateur Radio Equipment Company,
3 E. Douglas

**UCKY**

n The Collins Company, 411 W. Hayman Ave.
le – Arcby Electronics, Inc., 540 East Gray St.
sal Electronics Supply, Inc., 533 South 7th St.

**ANA**

ouge - Davis Electronics, 1735 North Acadian Way
harles – Wholesale Radio Equipment Co., Inc.,
2 Common St.
eans – Crescent Electronic Supply, Inc.,
S. Claiborne Avenue
Parts, Inc., 1112 Magazine St.
rn Radio Supply, 1909 Tulane Ave.

**LAND**

re Amateur Radio Center, TV Sound
munications, 2203 Fulton Ave.
y – Almo Radio, 317 Park Heights Ave.
n – Uncle Georges Radio Ham Shack,
24 Fern Ave.

**ACHUSETTS**

- Demambro Radio Supply Co., Inc.,
5 Commonwealth Ave.
tte Radio, 110 Federal St.
Shack Corporation, 730 Commonwealth Ave.
e Radio Shack Corporation
– Demambro Radio Supply,
Barnstable Rd.
e - Alco Electronics, 3 Wolcott Ave.
nbro Radio Supply, 473 Haverhill
ster – Demambro Radio Supply,
North Main St.
– Demambro Radio Supply, 135 Mystic Ave
– Graham Radio, Inc., 505 Main St.
Demambro Radio Supply, 280 Highland Ave
– Radio Shack Corporation,
gus Shopping Center
eld – Demambro Radio Supply Co., Inc.,
Spring St.
ster – Demambro Radio Supply Co., Inc.,
Summer St.

**GAN**

or – Purchase Radio Supply, 327 East Hoover Ave.
reek – Warren Radio Company, 93 W. Bidwell
Midway Electronic Supply,
01 W. McNichols Rd
uffy & Co., Inc., 2040 Grand River Ave.
est Electronics, 20926 Schoolcraft Ave.
Electronic Supply Co., 14405 Wyoming Ave.
Supply & Engineering Ham Shack,
helden Ave.
Supply & Engineering Co., 10605 Fenkell
Supply & Engineering, 10001 Chalmers
adio, 1314 Broadway
sing – Tape Recording Industries,
E. Grand River Ave.
and Radio Specialties, Inc., 2608 Leith St.
oo – Warren Radio Company,
S. Westnedge St.
te – Northwest Radio, 1010 W. Washington St.
– Warren Radio Company, 112 Cass Street
Radio Company, 1155 W. Front St.
on – Electronic Dist., Inc., 1960 Peck St.

**SOTA**

olis – Electronic Center, Inc., 107 3rd Ave.
tarks, Inc., 112 3rd Ave. North
nn Co., 67 South 12th St.

**SSIPPI**

– Swan Dist., Co., Inc., 342 N. Gallatin St.

**MISSOURI**

**Butler** – Henry Radio Co., 211 No. Main
**Kansas City** – Burstein-Applebee Co., 1012-1014 McGee St.
Burstein-Applebee Co., 305 E. 55th St.
**Saint Louis** Walter Ashe Radio Co., 1125 Pine St.

**NEBRASKA**

**Lincoln** Scott Electronics Supply Corporation, 2201 'O' St.
**Omaha** Ladd Electronics Co., 111 North 41st St.

**NEVADA**

**Las Vegas** – Metcalfs, Inc., 25 East California St.

**NEW HAMPSHIRE**

**Concord** Evans Radio, Inc., P. O. Box 312
**Dover** Demambro Radio Supply Co., Inc., 286 Central Avenue
**Keene** Demambro Radio Supply Co., Inc., 300 West St.
**Manchester** – Demambro Radio Supply Co., Inc., 1308 Elm St.

**NEW JERSEY**

**Atlantic City** – Almo Radio, 1800 Verona Ave.
**Camden** – Almo Radio, 1133 Haddon Ave.
**Mountainside** Federated Purchaser, Inc., 1021 U. S. Route 22
**Newark** Lafayette Radio, 24 Central Ave.
**Paramus** – Lafayette Radio, 182 Route 17
**Plainfield** – Lafayette Radio, 139 West 2nd St.
**Shrewsbury** – Federated Purchaser, Inc., 483 Broad St.
**Trenton** – Almo Radio, 201 Calhoun St.
**Vineland** – Almo Radio Co., 219 Landis Ave.

**NEW MEXICO**

**Albuquerque** – Radio Equipment Co., 523 East Central
**Roswell** – R & R Electronic Supply, 605 E. 2nd St

**NEW YORK**

**Albany** – Fort Orange Radio Dist., Co., 904-916 Broadway
**Amsterdam** – Adirondack Radio Supply, Inc., 191 W. Main Street
**Elmira** – Chemung Electronics, Inc., 403 E. Third St.
**Farmingdale** – Gem Electronics, 34 Hempstead Turnpike
**Jamaica** – Harrison Radio, 144-24 Hillside Ave.
Lafayette Radio, 165-08 Liberty Ave.
**Mineola** – Arrow Electronics, 525 Jerricho Turnpike
**New York** – Arrow Electronics, 65 Cortlandt St.
Harrison Radio, 225 Greenwich St.
Harvey Radio, 103 West 43rd St.
Lafayette Radio, 100 Sixth Ave.
**Scarsdale** – Lafayette Radio, 691 Central Park Ave.
**Syosset** – Lafayette Radio, 111 Jerricho Turnpike
**Syracuse** – Harvey Electronics Syracuse, Inc., Pichard Drive
Radio Shack Corporation
**Vestal** – Federel Electronics, Vestal Parkway

**NORTH CAROLINA**

**Asheville** – Freck Radio & Supply Co., 38 Biltmore Ave.
**Burlington** – Womack Electronic Supply Co., Inc., 623 South Worth Street
Womack Electronic Supply Co., Inc., 315 North Church
**Durham** – Womack Electronic Supply, 601 Ramseur St
**Goldsboro** – Womack Electronics Corporation, 106 N. Carolina St.
**Greenville** – Womack Electronics Corporation, 311 Boyd St.
**High Point** – Womack Radio Supply Co., 130 S. Lindsay
**Raleigh** – Womack Supply Co., Inc., 421 S. Salisbury St.
**Rocky Mount** – Womack Electronic Supply Co., 105 Marigold St.
**Winston Salem** – Womack Electronics Corporation, 926 Brookstown Ave.

**NORTH DAKOTA**

**Minot** – John Iversen Co., 216-2nd St., S.W.

**OHIO**

**Akron** – Warren Radio Company, 71 S. Broadway
**Canton** – Walkerradio, 1546 Fulton Rd., N.W.
**Cincinnati** – Costin Electronic, Distributors, 2345 Ferguson Rd
Mytronic Co., 2145 Florence Ave.
**Cleveland** – Bernon-Ray Service, Inc., 2118 E. 21st St.
Jeff-Tronics Unlimited, 4719 Memphis Ave.
Pioneer Electronics Supply, 5403 Prospect Ave.
**Dayton** – Custom Electronics, Inc., 1918 South Brown St.
Srepco, Inc., 314 Leo St.
**Elyria** – El A Company, 235 Lodi St.
**Toledo** – Warren Radio Company, 1002 Adams St.
**Youngstown** – Armies Electronics, 320 W. Federal St.

**OREGON**

**Albany** – Oregon Ham Sales, 409 First Ave.
**Portland** – Portland Radio Supply Co., 1234 S. W. Stark St.
United Radio Supply, Inc., 22 N. W. Ninth St.

**PENNSYLVANIA**

**Allentown** – A.A. Peters, Inc., 231 North 7th St.
**Easton** – Federated Purchaser, Inc., 925 Northampton St.
**Erie** – Warren Radio Company, 1313-15-17 Peach St.
**Lancaster** – George D. Barbey Co., 622 Columbia Ave.
**Norristown** – Almo Radio Co., 550 Markley St.
**Philadelphia** – Almo Radio, 913 Arch St.
Almo Radio, 7450 Frankford Ave.
Almo Radio, 6205 Market St.
Almo Radio, 5801 Rising Sun Ave.
Radio Electric Service Co., 709 Arch St.
**Pittsburgh** – Tydings Co., 933 Liberty Ave.
**Reading** – George D. Barbey Co., 333 North 4th St.
**Wyncote** – Ham Buerger, Rices Mill Rd. at Glenside Ave.

**RHODE ISLAND**

**Cranston** – Radio Shack, Corporation, 1301 Resevoir Ave.
**Providence** – Demambro Radio Supply Co., Inc., 1290 Westminster St.
W. H. Edwards, Inc., 116 Hartford Ave.

**SOUTH DAKOTA**

**Rapid City** – Burghardt Radio Supply, Jackson Blvd.
**Sioux Falls** Burghardt Radio Supply, 208 N. Weber
**Watertown** Burghardt Radio Supply, Box 746

**TENNESSEE**

**Chattanooga** – Curle Radio Supply Co., 439 Broad St.
**Dyersburg** – Warren Radio Company, Hiway 51 North
**Memphis** W & W Distributing Co., 644-46 Madison Ave.

**TEXAS**

**Abilene** Howard Radio, 1425 Pine
**Amarillo** – R & R Electronic, 707 Adams
**Corpus Christi** Electronic Equipment & Engineering Co., 805 S. Staples St.
**Dallas** Amateur Electronics, Inc., 2802 Ross Ave.
**Denison** – Denison Radio Supply, 310 W. Woodward St.
**El Paso** R & R Electronic, 2530 E. Yandell
**Fort Worth** – Amateur Electronics, Inc., 215 So. Jennings
**Houston** – Busacker Electronic Systems, Inc., 1216 West Clay
**Lubbock** – R & R Electronic Supply, 1607 Ave. G
**Victoria** – Electronic Equipment & Engineering Co., 1007 North William St.
**Wichita Falls** R & R Electronic Supply, 1300 - 12th St.

**UTAH**

**Salt Lake City** – Manwill Supply Company, 2511 S. State St.
Standard Supply Company, 225 E. 6th St.

**VIRGINIA**

**Arlington** – Key Electronics, 100 South Wayne St.
**Danville** – Womack Radio Supply Co., 513 Wilson St.
**Norfolk** – Priest Electronic, Inc., 6431 Tidewater Drive

**WASHINGTON**

**Aberdeen** – C & G Electronics Co., 510 West Wishkah
**Bremerton** – C & G Electronics Co., 1301 Pacific Ave.
**Centralia** – C & G Electronics Co., 217 So. Tower
**Olympia** – C & G Electronics Co., 318 No. Capitol Way
**Seattle** – C & G Electronics Co., 2221 3rd Ave.
Seattle Radio Supply, Inc., 2117 2nd Ave.
**Spokane** – Northwest Electronics, Inc., East 730 First Ave.
HCJ Electronics, E. 6904 Sprague
**Tacoma** – C & G Electronics Co., 2502 Jefferson Ave.

**WEST VIRGINIA**

**Wheeling** – Radio Parts Company, 1312 Main St.

**WISCONSIN**

**Fond du Lac** – Harris Radio Corporation, 289 North Main St.
**La Crosse** – Communications Equipment Co., 518 State St.
**Madison** – Satterfield Electronics, Inc., 1900 South Park St.
**Milwaukee** – Allied Radio of Wisconsin, 5314 N. Port Washington Rd
Allied Radio of Wisconsin, Point Loomis Shopping Center, 3555 S. 27th St.
Amateur Electronic Supply, 3832 W. Lisbon Ave.

**ALASKA**

**Anchorage** – Yukon Radio Supply, P. O. Box 406

## CANADA

**ALBERTA**

**Calgary** – Smalley's Radio Limited, 1105 7th Ave., West
**Edmonton** – Sacker Electronics, 10235 - 103rd St

**BRITISH COLUMBIA**

**Prince George** – Western Agencies, Limited, 409-3rd Ave
**Vancouver** – Canadian Electronics Limited, 971 Richards St
Pacific Electronics, 1641 West 2nd St.
Western Agencies Limited, 951 Seymour St.
**Victoria** – Western Agencies Limited, 2500 Douglas St.

**MANITOBA**

**Winnipeg** – Cam-Gard Electronic Distributor, 397 William Ave. at Ellen St.

**NOVA SCOTIA**

**Amherst** – Canadian Assemblies Limited, Station St.
**Halifax** – Consolidated Supply Limited, 86 Hollis St.

**ONTARIO**

**Downsville** – Alpha-Aracon Radio Co., Limited, 555 Wilson Ave.
**Fort Williams** – Inter-Comm Supply Co., 1315 Victoria Ave.
**Hamilton** – Crawford Radio, 119 John St., North
**London** – C. M. Peterson Co., Limited, 575 Dundas St.
**Ottawa** – Wackid Radio & TV Labs., 149 Gloucester St.
**Toronto** – Alpha Aracon Radio Co., 29 Adelaide St. West
Electro Sonic Supply Co., 543 Yonge St
Wholesale Radio & Electric Limited, 66 Orfus Rd.

**QUEBEC**

**Montreal** – Etco Electronics, 464 McGill St.
Payette Radio Limited, 730 St. James St., West
**Quebec City** – Crobel Limited, 225 Rue Lee St.

**NEWFOUNDLAND**

**St. John's** – Electronic Center, 90 Campbell St.

## GERMANY

**Bamberg** – Ing Hannes Bauer, Hornthal Strasso 8

## ITALY

**Genoa** – Standard Elettronica Italiana S.R.L.

# Been "reading the mail" lately?

Good news travels fast. And if you've been listening to local or DX bands you know that Gonset has come out with a new single side band transceiver that's everything you've been waiting for!

Of course you want the facts on the new Gonset GC-102, so here's the scoop. Whether you want to operate it barefoot or with shoes, the GC-102 is the best SSB transceiver you can buy!

Because the Gonset GC-102 receiver uses transistors and "hybrid" tubes, it operates from 12 volt DC with a minimum power drain!

Coupled with the Gonset GSB-201 Linear Amplifier, the GC-102 gives 1500 watts P.E.P. input.

**ONLY THE GONSET GC-102 SSB TRANSCEIVER GIVES YOU ALL THESE DELUXE FEATURES!**

- Mechanical filter used to generate side band.
- All bands, 80 through 10 meters, in basic 500 KC segments.
- 2-speed concentric dial drive with "coarse" tuning ratio of 20:1 (50 KC/revolution) and "vernier" tuning ratio of 100:1 (10 KC/revolution).
- Power input to final: 180 watts P.E.P.
- Receiver features dual conversion.
- Semi-digital dial presentation with 10 KC major divisions, 2 KC minor divisions.
- Highly stabilized VFO.
- Designed for mobile and fixed station operation.
- Separate AC and 12 volt DC power supplies.
- AC P/S forms pedestal for transmitter to match appearance of GSB-201 Linear Amplifier.
- "Edge-lighted" dial and illuminated "S" meter.
- 100 KC Crystal calibrator built in.
- Transceiver tunes WWV (15 Mcs) for calibration purposes.
- High voltage power supply is used only in "transmit" mode.
- VOX and speech amplifier sections are completely transistorized.

*For the Gonset distributor in your community consult list on the next page.*

GONSET®

DIVISION OF YOUNG SPRING & WIRE CORPORATION

801 SOUTH MAIN STREET, BURBANK, CALIFORNIA

For further information, check number 22, on page 126

# FOR FULL INFORMATION AND DEMONSTRATION OF GONSET QUALITY COMMUNICATIONS EQUIPMENT WRITE OR VISIT ANY OF THE FOLLOWING DISTRIBUTORS

## EASTERN STATES

**ALABAMA**
BIRMINGHAM
James W. Clary Company
1713 2nd Ave., South

**CONNECTICUT**
HARTFORD
Dressler Electronics
525 Trumbull Street
Radio of Hartford, Inc.
100 High Street
NEW BRITAIN
Universal Radio
53 East Main Street
NEW HAVEN
Radio Shack
230 Crown Street
NEW LONDON
Aikens Electronics Sup., Inc.
331 Broad Street
DeMambro Radio
334 Broad Street
STAMFORD
Radio Shack
High Ridge Rd.
WATERBURY
Bond Radio
339 West Main Street
WEST HAVEN
Aikens Electronics Supply
570 Orange Street
WEST HARTFORD
Radio Shack
39 South Main Street
WESTPORT
Music Systems of Westport
Post Road

**DISTRICT OF COLUMBIA**
WASHINGTON
Electronic Wholesalers, Inc.
2345 Sherman Avenue, N.W.

**FLORIDA**
MIAMI
Electronic Wholesalers, Inc.
3390 N.W. 27th Avenue
ORLANDO
Amateur Electronic Supply
23 Azalea Park Shop. Ctr.
TAMPA
Kinkade Radio Supply, Inc.
2719 Grand Central Avenue

**MAINE**
AUBURN
Radio Supply Co.
28 Cross Street
BANGOR
Radio Service Lab.
23 Palm Street
PORTLAND
Radio Service Lab
1004 Congress Street

**MARYLAND**
BALTIMORE
Amateur Radio Center
2203 N. Fulton Avenue
SALISBURY
Standard Electronics Co., Inc.
901 Snow Hill Road
TOWSON
Baynesville Electronics
1631 E. Joppa Road
WHEATON
Electronic Distributors, Inc.
11324 Fern Avenue

**MASSACHUSETTS**
BOSTON
Cramer Electronics
1111 Boylston Street
DeMambro Radio Supply Co.
1095 Commonwealth Avenue
Lafayette Radio
110 Federal Street
Radio Shack
730 Commonwealth Avenue
BRAINTREE
Radio Shack
Shopping Center
BROCKTON
DeMambro Radio
1839 Main Street
BUZZARDS BAY
Buzzards Bay Electronics
196 Main Street
FALL RIVER
Saddad Electronics
121 Pine Street
HAVERHILL
Valley Electronics
201 Winter Street
HYANNIS
DeMambro Radio
723 Barnstable Road
LAWRENCE
Alco Electronics
Wolcott Street
DeMambro Radio
794 Broadway
LEOMINSTER
DeMambro Radio
160 South Main Street
NEW BEDFORD
E. A. Ross Co.
1663 Purchase Street
MEDFORD
DeMambro Radio
235 Mystic Avenue
N. WESTPORT
DeMambro Radio
15 GAR Hwy., State Road
READING
Graham Radio
505 Main Street
SALEM
DeMambro Radio
280 Highland Avenue
SAUGUS
Radio Shack
Shopping Plaza
SPRINGFIELD
DeMambro Radio
269 Spring Street
WORCESTER
Radio Maintenance
80 Thomas St.
DeMambro Radio
222 Summer Street

**NEW HAMPSHIRE**
CONCORD
Evans Radio, Inc.
P. O. Box 312
DOVER
DeMambro Radio
3 Hale Street
KEENE
DeMambro Radio
300 West Street
MANCHESTER
DeMambro Radio
1308 Elm Street
PORTSMOUTH
Rockingham Electric
377 Court Street

**NEW JERSEY**
CAMDEN
Radio Electric Service Co.
513 Cooper Street
MOUNTAINSIDE
Federated Purchases, Inc.
1021 U. S. Rte. 22
PARAMUS
Lafayette Radio
182 Route 17
PATERSON
National Electronics
226—17th Avenue
UNION CITY
Nidisco, Inc.
2812 Hudson Boulevard

**NEW YORK**
ALBANY
Fort Orange Radio Dist. Co.
904-916 Broadway
AMSTERDAM
Adirondack Radio
185 West Main Street
BUFFALO
Genesee Radio & Parts Co.
2550 Delaware Avenue
CORTLAND
Winchell Electronics
65-67 Clinton Avenue
ELMIRA
Chemung Electronics, Inc.
403 E. Third Street
FREDONIA
Barker Higbee, Inc.
27 Water Street
JAMAICA
Harrison Radio
144-24 Hillside Avenue
Lafayette Radio
165-08 Liberty Avenue
MINEOLA, L.I.
Arrow Electronics
525 Jericho Turnpike
NEW YORK
Arrow Electronics
65 Cortlandt Street
Harrison Radio
225 Greenwich Street
Harvey Radio Co., Inc.
103 West 43rd Street
Terminal Hudson Radio
236 West 17th Street
ROCHESTER
Rochester Radio Supply Co.
600 East Main Street

**NORTH CAROLINA**
ASHEVILLE
Freck Radio & Supply Co., Inc.
38 Biltmore Avenue
CHARLOTTE
Dixie Radio Supply Company
1900 Barnwall Street
RALEIGH
Southeastern Radio Sup. Co.
414 Hillsboro Street

**OHIO**
ASHTABULA
Morrison's Radio Supply
331 Center Street
CINCINNATI
The Mytronic Co.
2145 Florence Avenue
Steinberg's, Inc.
633 Walnut Street
CLEVELAND
Bernon-Ray Service, Inc.
2118 East 21st Street
Broadway Electric Supply Co.
6209 Broadway, S.E.
Pioneer Electronic Sup. Co.
5403 Prospect Avenue
Radio & Electronic Parts Corp.
3235 Prospect Avenue
COLUMBUS
Universal Service
114 North Third Street
DAYTON
Custom Electronics, Inc.
1918 South Brown Street
Srepco, Inc.
314 Leo Street
DOVER
Southeastern Electronics
Specialists Co.
203 N. Tuscarawas Avenue
FREMONT
Swartzlander Radio, Ltd.
1524 Oak Harbor Road
LORAIN
Pioneer Electronic Supply Co.
1648 Broadway
MARION
Bell Radio Supply
527 N. Main Street
STEUBENVILLE
D & R Radio Supply
215 South Third Street
P. O. Box 670
TOLEDO
Selectronic Supplies, Inc.
3185 Bellevue Road
Warren Radio Co.
1002 Adams Street

**PENNSYLVANIA**
ALLENTOWN
A. A. Peters, Inc.
231 N. 7th Street
ALTOONA
Altoona TV Supply, Inc.
1720 Union Avenue
ELKINS PARK
A. G. Radio Parts Co.
939 Township Line
PHILADELPHIA
Almo Radio Company
913 Arch Street
PITTSBURGH
Tydings Company
933 Liberty Avenue
POTTSVILLE
Moyer Electronics Supply Co.
330 East Norwegian Street
READING
George D. Barbey Co., Inc.
333 North 4th Street
WYNCOTE
Howard C. Buerger Co., Inc.
Rices Mill Rd. & Glenside Ave.

**RHODE ISLAND**
CRANSTON
Radio Shack
1301 Reservoir Avenue
PROVIDENCE
DeMambro Radio
1292 Westminster Street
W. H. Edwards Co.
116 Hartford Avenue

**TENNESSEE**
NASHVILLE
Electra Distributing Company
1914 West End Avenue

**VERMONT**
BURLINGTON
Radio Service Lab.
703 Pine Street
ST. JOHNSBURY
DeMambro Radio
52 Portland Street

**VIRGINIA**
ARLINGTON
Key Electronics Division
Industry Services, Inc.
100 South Wayne Street
NORFOLK
Priest Electronics, Inc.
6431 Tidewater Drive

**WEST VIRGINIA**
CHARLESTON
Chemcity Electronic Dist.
1637 Fourth Avenue
HUNTINGTON
Electronic Supply, Inc.
222 Seventh Avenue

## CENTRAL STATES

**ARKANSAS**
TEXARKANA
Lavender Radio & TV Sup. Co.
522 E. 4th Street

**COLORADO**
DENVER
Radio Products Sales Co.
1237—16th Street

**ILLINOIS**
CHICAGO
Allied Radio Corp.
100 N. Western Avenue
Amateur Electronic Supply
6450 N. Milwaukee Avenue
Green Mill Radio Supply Co.
145 West 111th Street
Newark Electronics Corp.
223 W. Madison Street
MOLINE
Lofgren Distributing Co.
1212 Fourth Avenue
PEORIA
Klaus Radio & Electric Co.
403 E. Lake Street
Selectronics Supplies, Inc.
801 S. Adams Street
ROCKFORD
H & H Electronic Supply, Inc.
506-510 Kishwaukee Street

**INDIANA**
CHESTERTON
Northwest Distributing Co.
P. O. Box 7
EVANSVILLE
Castrup's Radio Supplies
1014 W. Franklin Street
INDIANAPOLIS
Graham Electronic Supply, Inc.
122 S. Senate Avenue
Van Sickle Radio Supply Co.
4131 N. Keystone Avenue
MARION
Myers Radio Supply
115-117 West 22nd Street
SOUTH BEND
Colfax Company, Inc.
747 So. Michigan Street

**IOWA**
COUNCIL BLUFFS
World Radio Lab.
3415 West Broadway
DES MOINES
Radio Trade Supply and/or
Amateur Radio Center
1224 Grand Avenue
SIOUX CITY
Two-Way Radios, Inc.
R. R. #2

**KANSAS**
WICHITA
Amateur Radio Equipment Co.
1203 East Douglas
SALINA
Electronics, Inc.
227 No. Santa Fe

**KENTUCKY**
LEXINGTON
Tel-Rad Electronics, Inc.
1401 Delaware Avenue
LOUISVILLE
Mobile Communications, Inc.
Bowman Field

**LOUISIANA**
NEW ORLEANS
Bell Radio Supply Co.
2625 Tulane
Crescent Electronic Supply
537 South Claiborne
SHREVEPORT
Ports Electronic Parts Co.
2423 Southern Avenue

**MICHIGAN**
ANN ARBOR
Purchase Radio
327 E. Hoover Street
DETROIT
M. N. Duffy & Co.
2040 Grand River W.
Radio Supply & Engr. Co.
90 Selden
Reno Radio Company
1314 Broadway
FLINT
Shand Radio Specialties Co.
2608 Leith
KALAMAZOO
Warren Radio Company
1710 S. Westnedge
MARQUETTE
Northwest Radio of Michigan
1010 W. Washington
MUSKEGON
Electronic Distributors, Inc.
1845 Peck Street

**MINNESOTA**
DULUTH
Northwest Radio of Duluth
123 East 1st Street
MINNEAPOLIS
Lew Bonn Company
1211 La Salle Avenue
Electronic Center
107—3rd Avenue

**MISSOURI**
BUTLER
Henry Radio
211 N. Main Street
JOPLIN
Norman Electronics
402 Wall Street
KANSAS CITY
Burstein-Applebee Co.
1012-14 McGee Street
ST. LOUIS
Walter Ashe Radio Co.
1125 Pine Street

**NEW MEXICO**
ALBUQUERQUE
Radio Equipment Co.
523 Central Avenue

**NORTH DAKOTA**
MINOT
John Iverson Company
216 Second Street, S.W.

**OKLAHOMA**
LAWTON
Reynolds Radio Supply Co.
908 "B" Avenue
OKLAHOMA CITY
General Electronic
1032 Classen
TULSA
Radio, Inc.
1000 S. Main

**SOUTH DAKOTA**
WATERTOWN
Burghardt Radio & Supply Co.

**TEXAS**
AMARILLO
R & R Electronic Supply Co.
707 Adams Street
CORPUS CHRISTI
Electronic Equip. & Engr. Co.
Box 3687
DALLAS
Amateur Electronics
2802 Ross Avenue
HOUSTON
Busacker Electronic Equip. Co.
1216 West Clay
Gilbert Company
2301 N. Main Street
Madison Electronics
1508 McKinney Street
SAN ANTONIO
Radio & Television Parts Co.
1828 W. St. Mary's Street

**UTAH**
SALT LAKE CITY
Manwill Supply Co.
2511 South State Street

**WISCONSIN**
LA CROSSE
Communications Equip. Co.
518 State Street
KENOSHA
Chester Electronic Supply Co.
2012—52nd Street
MILWAUKEE
Allied Radio of Wisconsin
5314 N. Port Washington Rd.
Amateur Electronic Supply
3832 W. Lisbon Avenue

## WESTERN STATES

**ALASKA**
ANCHORAGE
Yukon Radio Supply, Inc.
P. O. Box 406

**ARIZONA**
PHOENIX
Radio Parts of Arizona
214 So. 11th Avenue
Southwest Electronic Devices
129 E. Jefferson,
P.O. Box 3751

**CALIFORNIA**
BURBANK
Hagerty Radio Supply
2926 W. Magnolia Blvd.
BURLINGAME
Amrad Electronics
999 Howard Avenue
EL MONTE
Kimball & Stark
709 South Tyler Avenue
INGLEWOOD
Acorn Radio & Electronics
4736 West Century Blvd.
LONG BEACH
Scott Radio Supply Co.
266 Alamitos Street
LOS ANGELES
Henry Radio
11240 W. Olympic Blvd.
Radio Product Sales Co.
1501 So. Hill Street
MANTECA
Fulton Electronics
NORTH HOLLYWOOD
Arrow Sales, Inc.
7035 Laurel Canyon Blvd.
OAKLAND
Elmar Electronics
140—11th Street
ORANGE
Robinson Electronics
922 West Chapman
PALO ALTO
Zack Electronics
654 High Street
PASADENA
Dow Radio, Inc.
1759 East Colorado
POMONA
Com-Center
2134 N. Garey Avenue
RIVERSIDE
Mission Ham Supplies
5472 Mission Blvd.
SACRAMENTO
Calamar Electronics Co.
2163-A Fulton Avenue
Selectronics
4113 Franklin Blvd.
SAN CARLOS
Fortune Electronics Corp.
930 El Camino Real
SAN DIEGO
Western Radio & T.V. Supply
1415 India Street
SAN FRANCISCO
Amrad Supply, Inc.
3425 Balboa Street
San Francisco Radio Supply
1280 Market Street
Zack Electronics
1424 Market Street
SAN JOSE
Quement Indust. Electronics
161 North San Fernando
VAN NUYS
Valley Electronic Supply
17647 Sherman Way

**OREGON**
ALBANY
Oregon Ham Sales
409 West 1st Avenue

**WASHINGTON**
EVERETT
Pringle Radio Wholesale
2101 Colby Avenue
OLYMPIA
Colson Communications
4553 Stewart Street
SEATTLE
Radio Supply Co.
6213—13th Avenue, So.

## CANADA

**ALBERTA**
EDMONTON
Radio Supply Co., Ltd.
10184—104th Street
Sacker Electronics Co., Ltd.
10235—103rd Street

**BRITISH COLUMBIA**
VANCOUVER
Taylor Pearson & Carson Ltd.
1006 Richards Street

**MANITOBA**
WINNIPEG
Lee-Bern & Company Ltd.
341-347 William Avenue

**NEW BRUNSWICK**
MONCTON
Lewis-Price TV Co., Ltd.
15 Mount Royal Blvd.

**NEWFOUNDLAND**
ST. JOHNS
Electronic Centre, Ltd.
90 Campbell Avenue

**NOVA SCOTIA**
HALIFAX
Consolidated Supply Co., Ltd.
86 Hollis Street

**ONTARIO**
DOWNSVIEW
Alpha-Aracon Radio Co., Ltd.
555 Wilson Avenue
FORT WILLIAM
Lee-Bern & Company Ltd.
105 Simpson Street
HAMILTON
Crawford Radio
119 John Street N.
LONDON
C. M. Peterson Company, Ltd.
575 Dundas Street
NIAGARA FALLS
Niagara TV Supply Co.
1525 Main Street
NORTH BAY
Johnson Electric Supply Co.
135 McIntyre Street, East
TORONTO
Electro-Sonic Supply Co., Ltd.
543 Yonge Street

**QUEBEC**
MONTREAL
Electronic Tube Co., Ltd.
464 McGill Street
Payette Radio Co., Ltd.
730 St. James Street, W.

**SASKATCHEWAN**
SASKATOON
Radio Supply Co., Ltd.
561 Second Street

# . . . With All the Trimming

Wise Amateur Radio operators know that they can depend upon Heath for quality, dependability and performance at lowest cost! Savings realized through easy, do-it-yourself kit construction, make it possible for the radio amateur to equip his station with complete facilities at savings of up to 50%! You also enjoy latest engineering design and features for top performance and convenient operation. Whatever your need, whatever your interest . . . "Mobile", "Fixed", AM, CW or SSB . . . there's a Heathkit product to fill it! The handy accessories shown above are only a few of the many money-saving Heathkits available to make better contacts, more conveniently, and with added fun.

**1. MONITOR SCOPE:** Specially designed for Amateur use! Displays envelope, AF and RF trapezoid patterns. Ideal for checking "flat-topping" and non-linearity in SSB linear amplifiers, observing modulation characteristics of AM & SSB transmitters plus quality of received signals. Use on amateur bands 160 through 6 meters. Built-in two tone test generator. 10 lbs.
**Kit HO-10**...no money down, $6 mo.....**$59.95**

**2. REFLECTED POWER METER:** Checks efficid of antenna system by measuring forward and reflec power or standing wave ratio. Handles a peak po of well over 1 kilowatt and may be left in the ante system feed line at all times. Matches 50 or 75 c lines. Covers 160 through 6 meters. 2 lbs.
**Kit HM-11**.....**$15.**

**3. 100 KC CRYSTAL CALIBRATOR:** Perfect checking VFO's, receivers and other communicat gear! Provides precise output every 100 kc from 10 to 54 mc. Circuit is transistorized and battery pow for complete portability. .005% crystal included.
**Kit HD-20**.....**$14.**

**4. RF POWER METER:** Samples RF radiation antenna to give continuous indication of rela power output of transmitter. Sensitive 200 ua m Requires no external source of power for operat Covers 100 kc to 250 mc range. 2 lbs.
**Kit PM-2**.....**$12.**

# asy to Build Heathkits

**'CANTENNA" TRANSMITTER DUMMY LOAD:** mits testing or servicing transmitting equipment -the-air" . . . no TVI, QRM, or FCC violations to ry about! Handles up to 1 kilowatt I.C.A.S. with than 1.5 V. S. W. R. up to 300 megacycles. Fea- s oil-cooled resistor (oil not included). 2 lbs.
**HN-31** ..... **$9.95**

**TUNNEL DIPPER":** Exclusive with Heath! . . . a d-state grid dip oscillator. Covers 3 to 260 mc. roved circuit extends ambient operating tem- ature (0° to 120°F). Color-matched coils and dial es. Battery powered, use it anywhere! Complete rugged, epoxy coated coils, protective cover.3 lbs.
**HM-10A** . . . no money down, $5 mo..... **$34.95**

**ARIABLE FREQUENCY OSCILLATOR:** Pro- s complete coverage of amateur bands, 80 through eters. Rugged, reliable and loaded with special fea- s for top performance and stability. Use with most smitters designed for grid-block or cathode key- All connecting cables furnished. 12 lbs.
**HG-10**...no money down, $5 mo..... **$34.95**

**FREE CATALOG:**
Send today for your free 100 page Heathkit Catalog. Over 250 different quality kits to choose from. Save up to 50% with Heathkit.

HEATHKIT® by Daystrom

**HEATH COMPANY**
Benton Harbor 12, Michigan

Please send Free Heathkit catalog

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

For further information, check number 23, on page 128

# Packaged Power for Six

IRVING B. MICKEY*, W2LCB

*This 50 watt 50 mc transmitter is a compact and extremely stable unit for phone or c.w. It is broad banded over the first one mc of six meters and employs an unusual relay keying system fast enough to follow an automatic keyer with ease.*

A PREVIOUS issue of *CQ* carried an article by this writer describing a versatile little transmitter-exciter for 50 mc.[1] This piece of equipment was supposed to be the end-of-the-line, the final solution to the six meter problem at W2LCB, and if performance alone were the criterion it certainly would have been. Overlooked at the time, unfortunately, were the erosive effects of ham curiosity.

Before the little rig was a week old, tantalizing questions began to arise in the author's mind: was further miniaturization feasible?; could a reasonable degree of broadbanding be introduced without encountering the drive problems inherent in so many transmitters claiming this feature?; and, finally, could transmitter and power supply costs be reduced? The answers to all are displayed here.

Front view of the six meter transmitter shows enclosure construction and placement of the various controls. The base of the unit is a standard 5 × 7 × 2 inch aluminum chassis, and the upper compartment is a 5 × 7 × 3 inch chassis. Controls from lower left to upper right are the Crystal-V.F.O. switch, Meter switch, Mode switch, Pi-network Output capacitor, and Plate Tuning capacitor. The meter is sub-mounted behind a piece of aluminum screen.

## Circuit Description

The circuit, shown in fig. 1, is again the reliable old combination of Tri-tet oscillator-tripler, tetrode buffer-doubler, and 50 watt tetrode final. Corner-cutting at this stage of the game is false economy. The two-tube, overtone oscillator-amplifier circuits which are seen from time to time may appear simple at first glance but are far from that in actual practice. These transmitters are universally unstable, difficult to adjust, and impossible to key without objectionable chirp.

Serving as the oscillator-tripler in this unit is a 12BY7, which produces excellent output at 25 mc from 8 mc crystals. Its cathode is tuned to the 12 mc region by the $C_1$-$RFC_2$ combination, and its screen (in reality the anode of the oscillator section) is fed from a regulated source of only 105 volts. Provisions have been made for crystal switching, including one external crystal, or for an external v.f.o.

The buffer-doubler task has been assigned to the familiar 5763, which is also operated at very low plate and screen potentials. This stage is keyed in its regulated screen line in a rather unorthodox manner that will be described a bit later.

Completing the tube lineup is the old workhorse 6146, a somewhat eccentric beast but one whose performance at these frequencies and power levels has won widespread respect. Working straight through on 50 mc, with standard pi-network output, it handles its 50 watts of power input without a groan. Protecting the 6146 during periods of no drive is a 6AQ5 clamp tube, the screen of which is fed from a separate source to improve clamping action.

## Interstage Coupling

Interstage coupling is accomplished by means of pairs of link coupled, slug tuned coils. This offers several advantages, the most obvious

*1247 Baker Avenue, Schenectady 9, New York.

[1]Mickey, I. B., "A 50 watt, 50 Mc. Exciter", *CQ*, December, 1960, page 34.

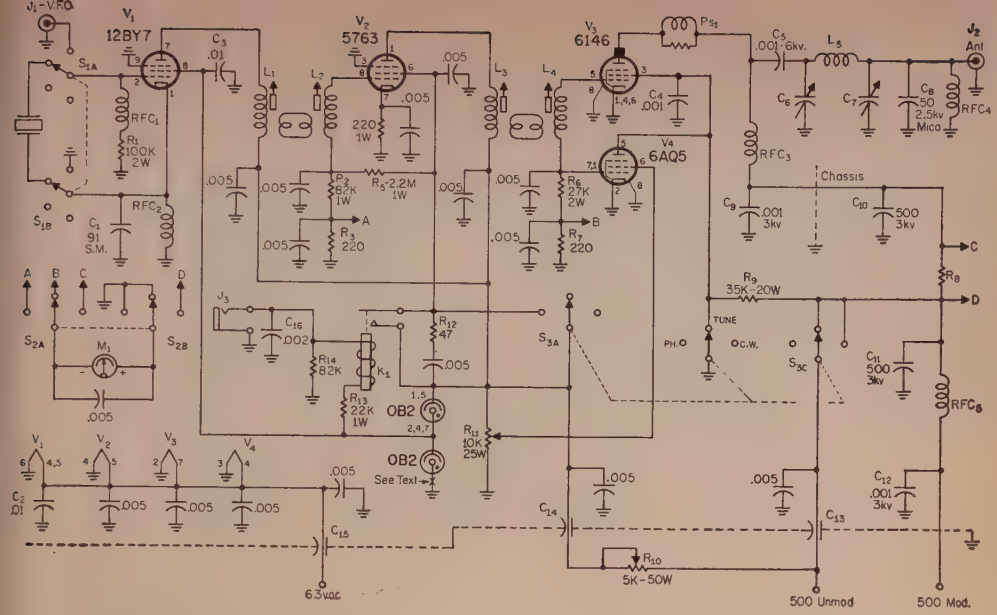



Fig. 1—Circuit of the broadbanded six meter transmitter. All resistors are ½ watt and all capacitors greater than 1 are in mmf unless otherwise noted. All capacitors are disc ceramic unless otherwise indicated.

$C_6$—30 mmf double spaced. Hammarlund HF-30X or equiv.

$C_7$—140 mmf. Hammarlund HF-140 or equiv.

$C_{13}$, $C_{14}$, $C_{15}$—.0023 mf ceramic feedthrough. Centralab FT-2300 or equiv.

$K_1$—S.p.d.t. relay. 5K coil (See Text).

$L_1$—25t. #28 e. closewound on CTC LS-3 form.

$L_2$—19t. #28 e. closewound on CTC LS-3 form.

$L_3$—10t. #24 e. closewound on CTC LS-3 form.

$L_4$—7t. #20 e. closewound on CTC LS-3 form.

Note—$L_1$, $L_2$ and $L_3$, $L_4$ are link coupled on the cold ends by one turn of insulated hookup wire.

$L_5$—6t. #12, ¾" inside diam., 1" long.

$M_1$—0-10 ma, 2½" type. Triplett #221-T.

$PS_1$—2t. #18 wound on 47 ohm 2 watt resistor.

$R_8$—28 turns #30e. on a 680K, 1 watt resistor (See Text).

$RFC_1$—750 microhenries, National type R-33 or equiv.

$RFC_2$—1.8 microhenries, Ohmite Z-144 or equiv.

$RFC_3$, $RFC_4$, $RFC_5$—7 microhenries, Ohmite Z-50 or equiv.

$S_1$, $S_2$—2 pole, 2-6 positions steatite rotary switch. Centralab PA-2003 or equiv.

$S_3$—3 pole, 2-5 positions steatite rotary switch. Centralab PA-2007 or equiv.

being that it permits some degree of broadbanding. A passband of one megacycle can be achieved readily with this transmitter, with very little drop-off in 6146 grid drive at either end of the range. With some sacrifice in drive it can be made to cover two full megacycles, but the former condition is preferable and actually very adequate. The vast majority of six meter activity is confined to the first megacycle of the band, and nearly all of that is within the first 500 kc.

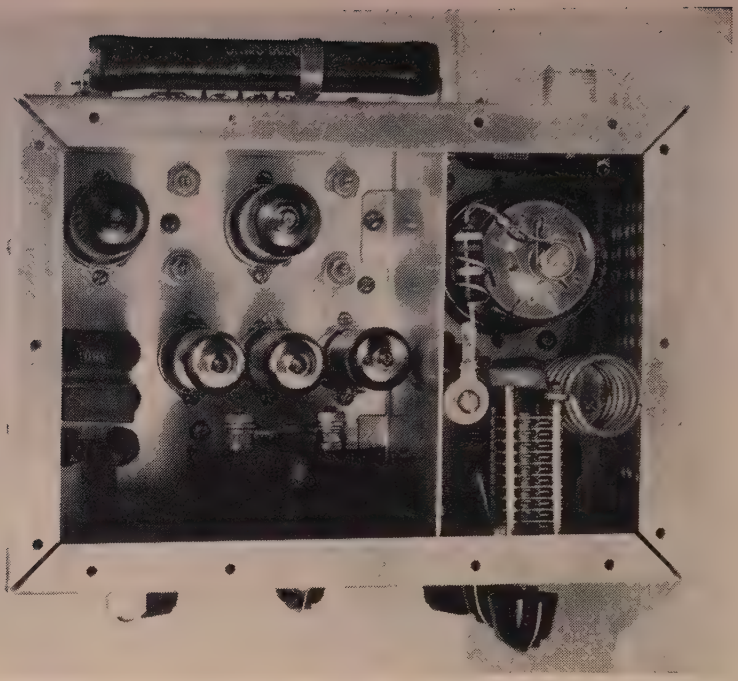
A second advantage of slug-tuned circuitry is the elimination of bulky and expensive tuning capacitors. In addition to its obvious implications this also has an important side effect. Variable capacitors, primarily because of their own inherent inductance, play an important role in the formation of parasitic circuits. The problem usually shows up at minimum capacity settings, where they tune their own and other stray inductance into the v.h.f.-u.h.f. parasitic region. Eliminate the capacitors, and the source of trouble is gone.

A final advantage of bandpass coupling is the reduction of signal feedthrough from the multiplier stages, particularly those traces of 8 mc energy which can be so disastrous in a channel 2 fringe area. The circuit illustrated here is so effective in its suppression of "subharmonic" energy that it is actually difficult to find a zeroing signal from a clean 8 mc v.f.o.

## Voltage Regulation

Voltage regulation is one of the secrets to success at these high frequencies, regulation of the oscillator screen usually being a necessity if the transmitter is to be keyed without chirp. Tieing down the buffer screen improves the situation just that much more and is, in fact, highly advisable when screen keying is used. In this case, a pair of 0B2s in series provides regulated voltages of 105 for the oscillator screen and 210 for the buffer screen and both low level plates.

Note that the screen of the clamp tube is fed from a fairly low resistance bleeder, $R_{11}$, which is tied to the top of the v.r. string. This serves two purposes: it improves clamping



Top view shows placement of tubes and other above chassis components. Tubes along the rear wall are the 12BY7 oscillator-tripler, 5763 buffer-doubler, and 6146 amplifier. Those in the center are, from left, the two OB2 voltage regulators and the 6AQ5 clamp tube. Stems of the interstage coil slugs are clearly visible between the r.f. tubes. The interstage shield is homemade and is discussed in the text. Compartment at the right contains the amplifier plate and output network components. The parasitic suppressor, plate tuning capacitor, and tank coil are clearly identifiable.

action and prevents clamp tube conduction on modulation peaks; and the key-up clamp tube screen current partly counterbalances that drawn by the plate and screen of the 5763 when the key is closed. The latter feature makes it possible to hold 0B2 current very close to the 30 ma rating during c.w. operation.

## Metering

Provisions have been made in this unit for metering of doubler grid, amplifier grid, and amplifier plate currents with a single instrument. That shown is a standard 0-10 ma meter of the 2½" variety. A homemade shunt extends the full-scale range to 250 ma for plate current measurements. Should a different instrument be used or a different plate range be desired, the shunt may be modified according to instructions found in any basic amateur handbook.

## Keying Circuit

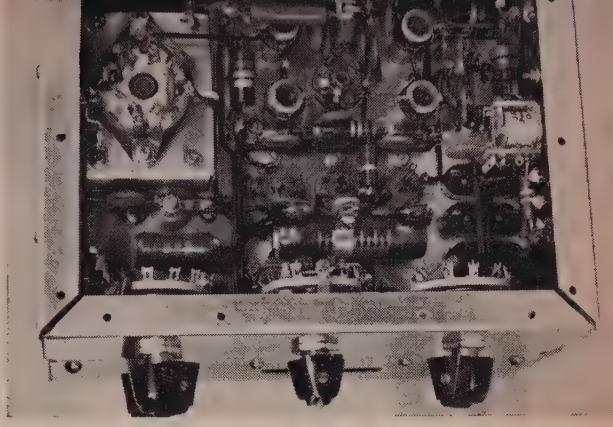
Although rarely encountered these days, screen keying is an old system and one which involves perfectly straightforward principles. The unique feature of this transmitter is the method by which it is accomplished.

Relay $K_1$ is a sub-miniature, current activated relay which closes with a coil current of between 2.0 and 2.5 ma. As shown in the diagram, it is fed from the regulated 105 volt source through resistors $R_{13}$ and $R_{14}$, the values of which establish the desired operating conditions. Relay current is varied between limits of approximately 1.0 and 5.0 ma simply by opening or closing a key across $R_{14}$. Since these limits are well removed from the pull-in value, rapid and positive relay action results.

The function of resistor $R_5$ was outlined in detail in the aforesaid *CQ* article, but it is unusual enough to rate a brief rehash. When the keying relay is closed, $R_5$ is too large to have any effect upon operation of the doubler stage. When the relay is open, however, it provides a direct path by which the negative control grid bias on the 5763 can find its way to the screen. This completely cuts off the tube and reduces keying backwave to a minimum.

The system as a whole offers several advantages, the most important of which is that extremely small currents and low power levels are broken at both key and relay contacts. Consequently, sparking at both points is reduced to a bare minimum, and shock hazard at the key is completely eliminated.

Under these conditions it is possible to use a very small, fast-acting relay. The one illustrated is the "Standard Model Little Gem" relay, manufactured by Jaidinger Products of Chicago and normally found in radio control devices. Smaller than the first joint of a man's

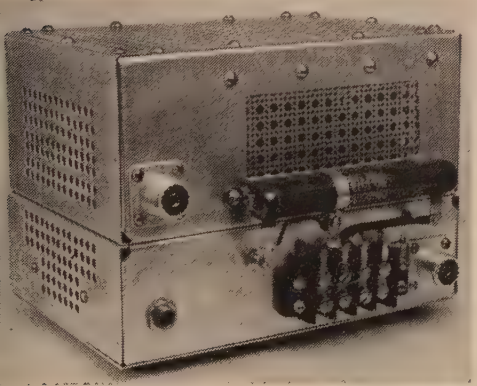


Bottom view shows sub-mounting of the 6146 tube socket on the 3-sided mounting bracket, placement of the interstage coils, and the uncluttered effect which results when components are laid out parallel to chassis walls. The keying relay is mounted on a piece of phenolic board at the right. The large resistor in the center is the clamp tube bleeder, $R_{11}$. R.f. choke at the rear is part of the filter network for the modulated plate line.

thumb, it employs a featherweight armature, light spring tension, and very narrow contact spacing. As a result, it will follow at astonishing speeds, making it ideal for use with a bug or a fully automatic keyer.

Although not a radio store item, this relay may be obtained readily in model aeroplane shops or from its principal distributor: Ace Radio Control, Box 301, Higginsville, Missouri. By the same token, any other small current sensitive relay could be used, provided that resistors $R_{13}$ and $R_{14}$ are adjusted to satisfy the new operating conditions. The two together should hold coil current to approximately one-half the pull-in value, and $R_{13}$ alone should permit about twice the critical value to flow.

While this circuit is a bit more complex than some, it pays off in the form of an excellent keying characteristic. The note is hard enough to insure pleasant copy, even at very high speeds. At the same time, despite the absence of elaborate shaping and filtering measures, there is just enough softness on both make and break to indicate that the click situation is well in hand. This has been verified on the home station receiver and by other amateurs in the immediate area.



Rear view illustrates steps taken to provide ventilation. The large resistor is the main dropping resistor, $R_{10}$. Visible below it are the feedthrough bypass capacitors which filter the power leads. The output jack is at the upper left, the key jack just below it, and the v.f.o. input at the lower right.

## Stability

Overall stability of the transmitter is excellent, although it will not quite meet one of the author's favorite brute force tests. There is just enough regeneration in the 6146 stage to permit a weak fundamental frequency oscillation when it is operated with full plate voltage, no drive, and no load. This is the result of somewhat less than perfect interstage shielding and of the very light grid loading provided by the slug-tuned tank circuit.

But don't worry about this condition any longer than it takes to read these words! With any load whatever connected to the output jack, even with the pi-network output capacitor fully meshed, there is absolutely no tendency toward self-oscillation. Under operating conditions, in fact, the regeneration is so slight that its effect upon tuning is scarcely discernible. This adds up to one thing: the stage does *not* require neutralizing.

Parasitic difficulties have been reduced to a bare minimum in this rig by eliminating interstage tuning capacitors. The only trace of instability encountered was a weak u.h.f. gremlin in the 6146 stage, and this yielded without a struggle to plate suppressor $PS_1$.

Frequency stability is well above average for six meter equipment. There is a slight change in crystal frequency as the chassis and the inside of the enclosure are coming up to operating temperature, but this is common to all v.h.f. transmitters which are buttoned up in such small packages and which use cheap surplus crystals. Prolonged tests show the total drift to be within the tolerances specified for *commercial* transmitters operating at these frequencies.

## Heating

While miniaturization contributes to the appearance of equipment, it is not without its hazards. Foremost among these, of course, is heating, and this can be a deceptive thing to evaluate. The important thing to remember is that *internal* temperature is the decisive factor.

As might be expected, the outside of this little package becomes quite hot. To determine just what was happening inside, a thermometer was inserted in the enclosure, and several extended test runs were conducted under the worst conditions which could be created. At no time did temperatures in either the oscillator-doubler or the 6146 compartments reach a dangerous level. Furthermore, important below-chassis components such as interstage coils, bypass capacitors, and small resistors became barely lukewarm to the touch.

### Major Construction Features

Equipment enclosures made from standard metal components may never win any style contests, but they are hard to beat from the standpoint of simplicity. The model illustrated here utilizes two readily available items, a 5 × 7 × 2 inch aluminum chassis as a base and a 5 × 7 × 3 inch chassis as a top compartment.

The latter is subjected to some rather extensive work-bench surgery. What would normally be its top is cut out with a hacksaw to leave a ⅜" flange on all four sides. When the enclosure is assembled, this section is mounted upside down against the base chassis, the flange providing the metal-to-metal contact essential for proper shielding. The original bottom flange is somewhat wider and makes a better surface for the top cover of the completed transmitter.

Ventilating measures include a top cover of Reynolds perforated aluminum stock (available in hardware stores) and a second strip of this material at the rear of the upper chassis. It may also be used as a bottom plate, but a solid sheet of heavier aluminum, generously sprinkled with hand-drilled holes, is recommended for this purpose. Rubber feet should be affixed to the latter to allow air flow beneath the transmitter. Ventilating holes in the end sections are all hand-drilled, since the working space is too limited to permit practical use of the perforated stock.

Since the 6146 will not fit within a 3" chassis its ceramic socket is submounted on a small aluminum bracket 2¼" × 1¾" with only side flanges ¾" high. This, in turn, is supported at all four corners by ¾" metal spacers which provide added strength and insure adequate spacing from the chassis. The only precaution to observe in making the bracket is to drill or punch the necessary holes before folding the sides, making certain that all are precisely aligned with their mates in the chassis. When mounted, the open end of the three-sided contrivance should face the near end of the chassis, thus encouraging additional air movement around the base of the tube.

The interstage shield is also a do-it-yourself item. No dimensions are given here, because the size of these "standard" chassis varies slightly. Simply cut out a rectangular piece of aluminum which will fit comfortably within the chassis you happen to have. Leave two small tabs on the rectangle which can be folded over to form mounting feet. These need only be wide enough to offer firm footing for the shield and should be so placed that they do not conflict with other components.

Meters of the so-called 2½ inch variety will just fit within the 3 inch top enclosure. Note that this one is submounted behind a piece of aluminum screen. This, in turn, is backed up by a small aluminum plate to provide stiffness and to insure proper contact with the panel. When submounting a meter in this fashion remember to provide some means for zeroing the pointer (note the small hole in the panel) and to spray the exposed part of the screen with flat black paint to reduce glare.

The keying circuit has been wired on a small piece of phenolic board as a separate sub-assembly. This is structurally convenient and also provides the insulation necessary with this relay, the mounting frame and armature of which are electrically common. Ordinar

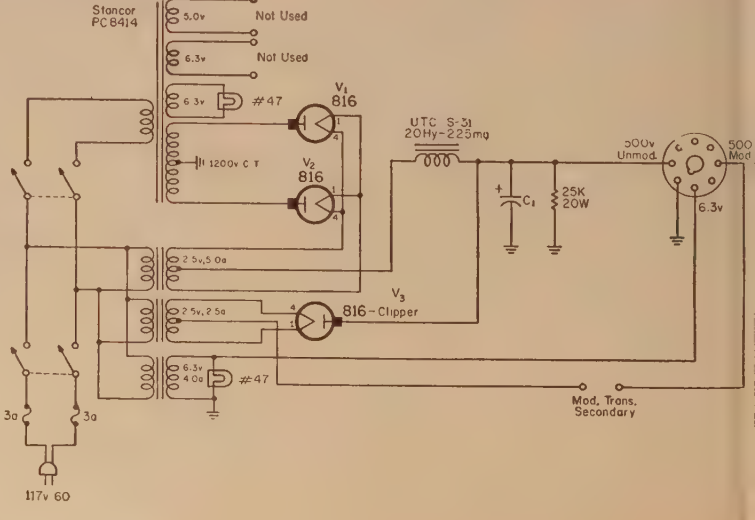



Fig. 2—Power supply circuit for use with the six meter transmitter. The clipper, $V_3$, is described in the text. Capacitor $C_1$ can be any parallel or series combination which will provide 20 mf at 600 volts.

fiber insulating washers would satisfy this requirement equally well.

Most of the components in the final amplifier compartment are visible in the photograph, but a few of the mounting details are not clear. Plate voltage is brought through the chassis by a small ceramic feedthrough insulator, and the line is bypassed on both sides of this by $C_9$ and $C_{10}$. The plate tuning capacitor, $C_6$, is mounted with its stator lugs on top and in a horizontal plane. Output capacitor $C_7$ is just below it with its stator terminals to the right in a vertical plane. This configuration simplifies mounting of the tank coil.

Getting the heavy tank coil into its cramped quarters is easier than it looks. First, mount the two variable capacitors in their proper relative positions but on the *outside* of the enclosure. Next, wind the coil according to specifications, gauge by eye its placement with respect to the condensers, and form small loops in the ends which will fit over the appropriate pair of stator lugs.

## Mounting and Wiring Sequence

Although space is at a premium, assembly and wiring are tricky only in the initial stages. It is suggested that the first items mounted be the 6146 plate feedthrough insulator, the ceramic pillar, the top enclosure, the 6146 tube socket assembly, and any tie strips which will lie directly below the amplifier compartment, in that order. Then, working up gradually from chassis level, mount and wire the remainder of the amplifier plate circuit components. Finally, button up the compartment by mounting the interstage shield.

From this point on, any reasonable sequence may be followed. Just take time to plan placement of components, so that you don't cover up mounting holes or work yourself into tight corners. To avoid damage to windings, the little interstage coils should be mounted last. After initial tuneup, the coils and their associated links should be cemented in place with polystyrene coil dope.

## Layout Modifications

Some builders may wish to spread the little rig over a larger chassis area or otherwise modify the layout. In doing so, simply observe three basic precautions: keep all leads which carry r.f., particularly bypass capacitor leads, as short as possible; avoid interstage feedback problems by running all three stages of the transmitter across the chassis in a straight line; and, if interstage link lines are lengthened appreciably, ground them. Also remember that physical changes may alter stray circuit constants sufficiently to require minor coil modifications.

## Power Supply

Any power supply delivering 6.3 volts at 3.5 amperes and roughly 265 to 650 volts at 200 milliamperes may be used with this transmitter. The high voltage limits are established by the range of the main dropping resistor, $R_{10}$, and the current requirements of the voltage regulator network. In practice, however, best balance between transmitter power and tube life will be achieved with a plate supply of 400-500 volts.

A diagram of the power supply, fig. 2, is included primarily to show the location of the modulator terminals and the high level clipper which it contains. The latter reduces splatter by preventing the plate of the 6146 from being driven negative on modulation peaks. Examination of the two circuit diagrams will reveal that both $V_3$ and the secondary of the modulation transformer are shorted out during tuning or c.w. operation. If the "clipper" is not used, modulator output may be connected directly to the two 500 volt terminals at the rear of the transmitter.

This power supply could be simplified considerably by substituting silicon diodes for the 816s and by lighting the transmitter filaments from the 6.3 volt windings on the main power transformer.

## Tuneup

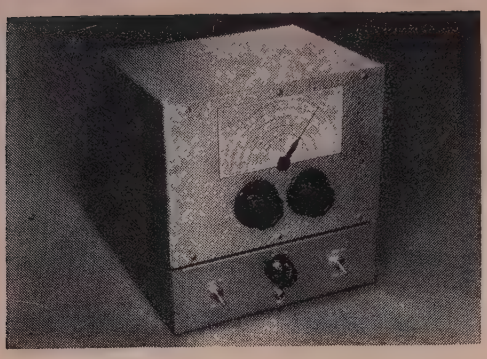
Tuneup will sound far worse in print than it is in practice, but, if the suggested numerical sequence is followed, no difficulty should arise. For steps 1-8, disconnect the modulated plate line, set $C_7$ at maximum capacity, and connect a dummy load to $J_2$. Turn off the plate supply between tests and when adjusting resistor sliders. Unless otherwise indicated, the key should be closed during adjustments involving 6146 grid or plate current readings.

STEP 1—Set $S_3$ to TUNE position, set the sliders on $R_{10}$ and $R_{11}$ to approximately mid-range, and (preferred method) insert a 0-50 or 0-100 ma meter temporarily in the ground return line of the v.r. string at the point marked "X" in fig. 1. Adjust $R_{10}$ for a v.r. current of 5-10 ma *with the key closed*. If a meter is not used at point "X", simply adjust $R_{10}$ so that the lower (closest to ground) 0B2 barely remains lighted under key-down conditions.

STEP 2—Adjust the slider of $R_{11}$ for a reading of 100-105 volts *with the key open*, and check again to see that both v.r. tubes are lighted. If one of them is out, decrease the resistance of $R_{10}$ very slightly, and re-set $R_{11}$ for the proper reading. Then tighten $R_{11}$ and forget about it.

STEP 3—Set the transmitter frequency to the middle of the desired 1 mc operating range (for this description, and for most operating purposes, let's make this 50.50 mc). Set $S_2$ to read 5763 grid current, and alternately adjust $L_1$ and $L_2$ for maximum reading. Repeat the adjustments until there is no further change. When the slugs are properly set, the reading should be close to 1 ma (perhaps more if you have an extremely active crystal or high output v.f.o.

[*Continued on page 120*]



The "Silver Sentry" a high stability v.f.o. derives its name from the fact that the 10" × 8" × 7" utility box housing the inner chassis, which is insulated with fiberglass wool, is sprayed with silver paint for heat reflection purposes. The large controls are V.F.O. tuning and FINE tuning. The key jack is just below the band switch and the SPOT switch is on the right.

# The "SILVER SENTRY" A Super-Stable Variable Frequency Oscillator

BY HARTLAND B. SMITH*, W8VVD

*The stability of this variable frequency oscillator approaches that of the highest quality commercial broadcast equipment. If stability is what you are looking for, then this 1750-2000 kc, 40 and 80 meter v.f.o. is the project for you.*

HAVE you tuned across the ham bands lately and noticed how many transmitters chirp, wobble under amplitude modulation or drift into Donald Duckishness on s.s.b? Only a few moments of critical listening are needed to reveal that a good number of amateur signals are definitely not "state of the art." Apparently, many fellows put up with frequency instability because they are unaware of how easy and inexpensive it is to generate clear, crisp, steady signals.

The v.f.o. described here, which can be built for less than fifty dollars, will, when added to your present transmitter, generate a truly top notch signal.

The graphs of fig. 1 strikingly reveal the "Silver Sentry's" superiority over its factory built counterparts. For ease of visual comparison, deviation from the starting frequency is shown on each graph as a positive value, although in some cases, drift was actually negative. All tests were made at 3600 kc in a room with a relatively constant temperature.

If you are looking for crystal-quality c.w.; an f.m.-less a.m. carrier or a sideband signal that stays where it's supposed to, you should seriously consider adding this piece of equipment to your station.

### *Other Advantages*

Besides its insignificant drift, the "Silver Sentry" also boasts a number of other important characteristics which contribute to its superb performance. Line voltage fluctuations have practically no effect on its frequency. When a 1600 watt load is placed on the branch circuit feeding the shack a.c., the room lights dim, but the v.f.o. moves less than half a cycle.

Some fellows like to leave plate voltage on while standing by, in order to minimize frequency changes resulting from variations in anode temperature. No such precaution is required with this unit since there is only about a fifth of a cycle shift when plate and screen voltages are applied after an extended stand-by period.

Zeroing on another station is a ticklish job with a conventional sideband transmitter having a tuning rate of 5 or 10 kc per revolution. Since

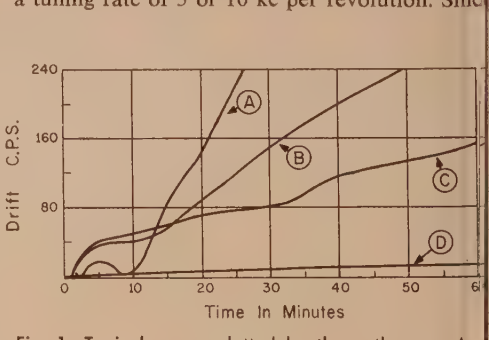



Fig. 1—Typical curves plotted by the author on: A—a medium priced commercially available s.s.b. transmitter; B—a high quality a.m. transmitter, circa 1952; C—top quality s.s.b. transmitter and D—The "Silver Sentry"

*467 Park Ave., Birmingham, Michigan.

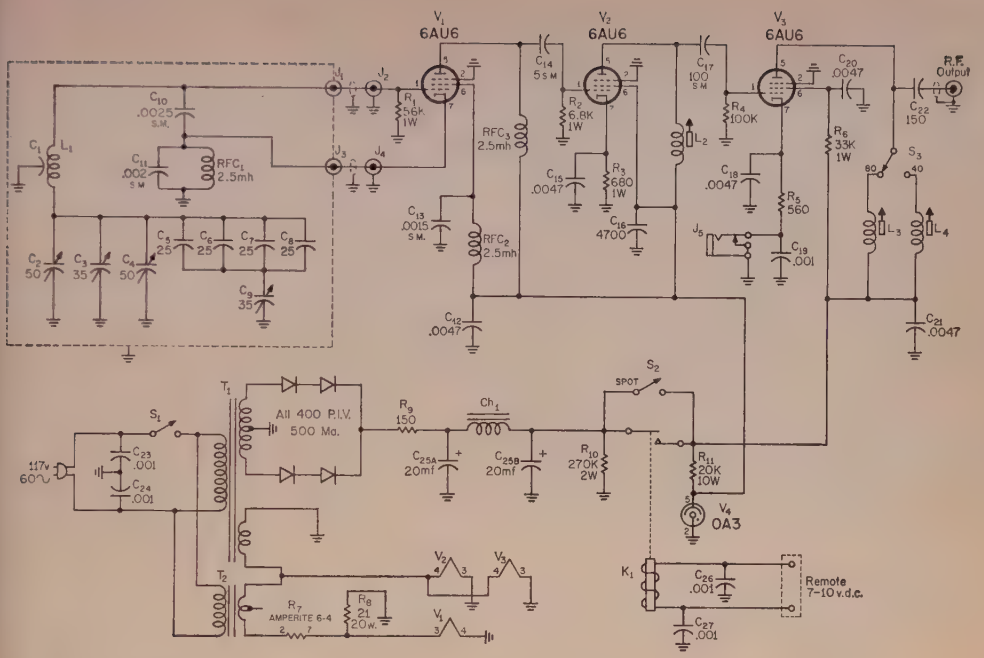



Fig. 2—Circuit diagram of the "Silver Sentry" an ultra-stable variable frequency oscillator with r.f. output on 80 and 40. All decimal value capacitors are disc-ceramic unless otherwise noted.

$C_1$—See Text.
$C_2$—50 mmf, double spaced, double bearing variable. Hammarlund MC-50-SX.
$C_3$, $C_9$—35 mmf air padder.
$C_4$—50 mmf air padder.
$C_5$, $C_6$, $C_7$, $C_8$—25 mmf, N750 temperature compensating capacitor.
$C_{22}$—150 mmf mica.
$CH_1$—3.5 hy, 50 ma, Stancor C-1080.
$J_5$—Closed circuit key jack.
$L_1$—62 t. #28 e., 1¼" dia., spaced dia. of wire on Allied Radio 71H-713 polystyrene form.
$L_2$—81 t., #28 e., closewound on ⅜" dia. slug-tuned form; Superex C4.
$L_3$—65 t., #32 e., closewound on ⅜" dia. slug-tuned form; Superex C3.
$L_4$—52 t., #28 e., closewound on ⅜" dia. slug-tuned form; Superex C3.
$RFC_1$, $RFC_2$, $RFC_3$—2.5 mh, 125 ma.
$K_1$—S.p.s.t., d.c. relay—Sigma 11F-1000G-Sil.
$S_1$, $S_2$—S.p.s.t. switch.
$S_3$—S.p.d.t. rotary switch, ½ Centralab SP-1003.
$T_1$—230-0-230 v., 50 ma, 6.3 v., 2.5 amp., Stancor PC-8418.
$T_2$—6.3 v., 0.6 a., Stancor P6465.

the bandspread capacitor of this oscillator has an 80 meter tuning rate of only 200 cycles per revolution, one can zero down to the last slow beat with ease. Furthermore, backlash is held to an absolute minimum.

### *The Circuit*

After scanning just about every v.f.o. article that has appeared in American ham publications and after experimenting with a number of the more promising circuits, I finally settled on a Clapp, or series-tuned Colpitts oscillator. With this circuit, fig. 2, variations in tube capacity and other external changes are pretty well swamped out by $C_{10}$ and $C_{11}$.

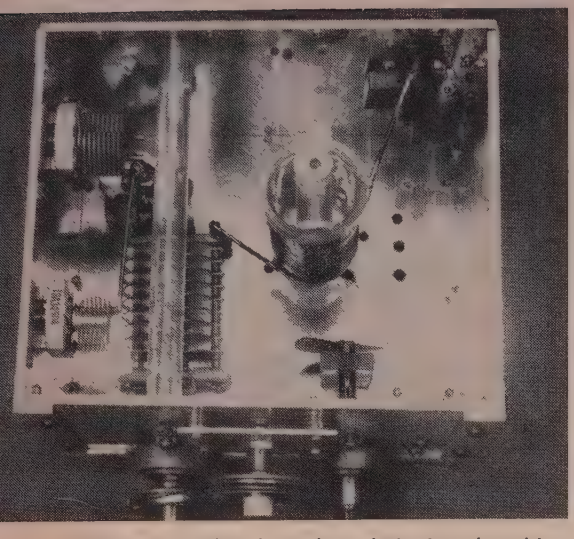
Another important advantage of the Clapp circuit is that both the grid and cathode connections are made at points of very low r.f. impedance. Consequently, the oscillator tube may be located at a distance from the tuning components and interconnection accomplished by means of coaxial cable. Mounting the tube well away from $L_1$ and $C_2$ prevents heat, generated by the tube, from reaching the coil and capacitor.

In spite of its numerous advantages, a Clapp oscillator has one bad feature. The more immune you make it to external electrical changes, the more prone it becomes to mechanical instability.

The junction of $L_1$ and $C_2$ is at a high impedance with respect to ground. The slightest movement of the coil or capacitor in relation to nearby metal objects can cause an unwanted shift in frequency. To prevent serious microphonics from developing, all components within the tuning compartment must be well anchored and the box, itself, carefully shock mounted.

The grid circuit of $V_1$ tunes from approximately 1750 to 2000 kc, a range which is sufficient to encompass, by means of harmonics, all ham bands from 80 through 10 meters.

After trying an assortment of highly touted oscillator tubes, that old workhorse, the 6AU6A, was finally chosen. All factors considered, it appears to be the best possible v.f.o. tube.



The heart of the v.f.o. is the tank circuit packaged into a home-brew ⅛" aluminum box. The ½" poly rod running front to back was needed to reduce cabinet flexing. The single plate, variable capacitor at the right is the very fine tuning control.

Because of its extremely low grid-plate capacity, a 6AU6A oscillator is little affected by what happens in the following amplifier stages. Interelement capacity changes during warm-up and susceptibility to microphonics are also much less pronounced than in higher transconductance tubes.

$V_2$ serves as a frequency doubling isolation amplifier. The light coupling provided by $C_{14}$, together with the low resistance of $R_2$ effectively discriminate against reactive effects occurring in the last two stages of the v.f.o. which might otherwise be reflected back into the oscillator and impair its stability. The extremely low grid-plate capacity of $V_2$ further enhances the excellent isolating properties of that stage. Performance of this grounded cathode circuit is definitely superior to the cathode follower configuration usually recommended for isolating purposes.

The r.f. output is adequate to drive the input of almost any amateur transmitter.

### *Construction*

A 3"×14"×10" steel chassis serves as a support for the v.f.o. components. Because of its greater strength, steel rather than aluminum should be used. A 10"×14" bottom plate containing a number of ¼" ventilation holes shields the under part of the chassis from external r.f. fields. Four ¼" thick mounting feet support the v.f.o. high enough above the operating desk to allow air to enter the holes.

A 10"×8"×7" utility cabinet serves as an outer housing for the tuning components. Spray the box, both inside and out, with aluminum paint to reduce its heat absorbing properties. Fasten it to the chassis with a combination of bolts, bushings and gum rubber grommets as illustrated in fig. 3.

### *Capacitors*

Capacitors $C_1$ through $C_{11}$, as well as $L_1$ and $RFC_1$ are housed in a specially constructed 6"×5"×4" aluminum compartment with ⅛" thick walls. The front and rear panels measure 4"×6"; the top and bottom, 5"×6" and the sides 4"×4¾".

Mount ½"×½"×1/16" angle stock on the corners of the box. Using plenty of ¼" 6-32 machine screws. If you lack suitable tools for threading the screw holes, #6 self tapping screws may be employed.

Do *not* attempt to substitute a factory manufactured 6"×5"×4" box as they are too flimsy for this purpose.

Thermal stability will be improved if you fill the air spaces between the inner and outer boxes with a suitable insulating material. I bought a yard of one-inch thick fiberglass wool for the purpose at the local lumber yard and cut it into small pieces with a pair of scissors. I then surrounded the inner box with the two layers of insulation visible in the photographs.

Use a 7½"×9" piece of polyfoam padding to support the tuner. Make a diagonal cut at each corner so that the padding will clear the mounting screws and grommets which hold the outer box to the chassis. Cement the padding to the inner surface of the bottom of the box.

A number of materials were tried, but ¾" thick polyfoam, a substance containing foam plastic flakes bonded with latex, proved to be most effective as a shock absorber. If your local upholstery store can't supply you with polyfoam a 16"×16" section may be obtained from Montgomery Ward. The catalog No. is 71A6052 and the price is 54¢, plus postage for one pound.

A 7¼"×9" Masonite board, bolted to the bottom of the tuner, helps distribute its weight evenly over the entire surface of the padding. Drill a hole in the Masonite to allow access to $C_9$ during preliminary adjustments. Later on, when the v.f.o. has been aligned, the Masonite can be glued to the padding to prevent the tuner from skidding around inside the larger box.

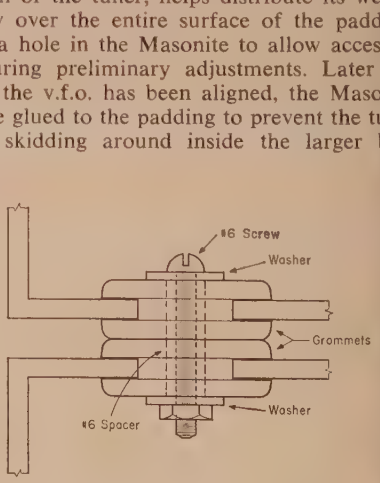



Fig. 3—Details of the shock mounting between chassis and box. This method also reduces heat conduction between units. Grommets are General Cement #HO 43-F.

### *Inductor, $L_1$*

A relatively high-$Q$ coil is required at $L_1$. Since ceramic coil forms of the required size are no longer listed in jobber catalogs, a standard 4 prong polystyrene form was picked as a foundation for $L_1$.

Before winding the coil, remove the base pins from the form by heating them with a soldering iron until the surrounding plastic softens, pulling them out with long nosed pliers.

For maximum $Q$, spacing between turns should be equal to the diameter of the wire. You can easily accomplish this by winding the coil with two wires, side by side, removing the extra wire when the coil is completed. The remaining winding will then be perfectly spaced, and may be moisture proofed with several coats of polystyrene cement or "$Q$-Dope." Do *not* use ordinary service cement.

Cement a ⅞" length of ½" diameter poly rod to the base of the form as shown in fig. 4. Cement a 1½" length of the same material across the top of the coil. Finally, cement a ½" piece of rod, vertically, at the midpoint of the top piece. After the rods have been put on the coil form, it should be exactly the right length to fit snugly between the top and bottom covers of the tuning box, where it can be held in place with self-tapping or machine screws.

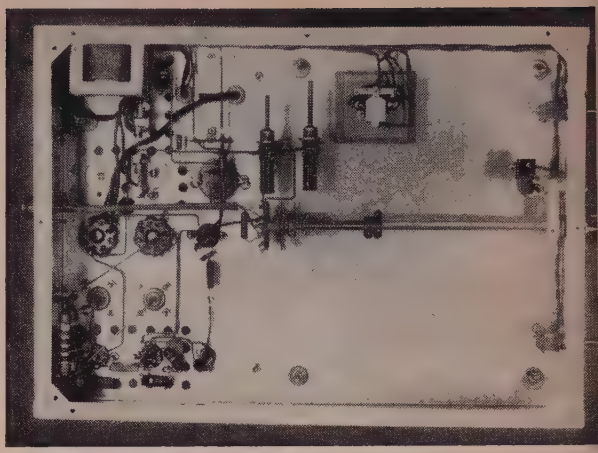
### *Variable Capacitor, $C_2$*

Capacitor $C_2$ must be a fairly husky, double spaced, two bearing capacitor. A transmitting type variable which was originally used, proved unsatisfactory because the plates were merely pressed into the rotor and stator supports instead of being securely soldered. Although it looked mighty rugged, the capacitor was actually very noisy. Make certain that the plates of the capacitors you choose for $C_2$, $C_3$, $C_4$ and $C_9$ are all well soldered.

A planetary vernier drive is fastened to the shaft of $C_2$. (see photos) A pulley, salvaged from an old b.c. receiver, is slipped over that part of the planetary drive which turns at the same speed as the capacitor shaft. This pulley drives another pulley (dial indicator) on the shaft of a ¼" panel-bearing assembly mounted slightly above center of the inner box's front panel. A small spring maintains proper tension on the dial cord running between the two pulleys.

You will note that the bearing assembly is fastened to a plate that has been bolted 3/16" in front of the panel. Don't mount the bearing directly on the panel. This would permit the rear portion of the pointer shaft to extend into the inner box. Any play in the bearing would allow the shaft to slide back and forth, altering its position relative to $L_1$ and causing a slight change in the transmitted frequency.

To spread 80 meters over as much of the main dial as possible, remove two rotor plates from $C_2$; one from each end of the shaft. Discard one



This view illustrates the mounting of the output inductors $L_3$ and $L_4$. Notice the ventilating holes around the heat producing components at the left.

one of the plates and solder the other to a ¼" diameter brass shaft. Insert the end of the shaft away from the capacitor plate into the right hand planetary drive mechanism. You will note from the photographs that the single capacitor plate is approximately an inch from $L_1$. As it is rotated and changes position with respect to the coil, it provides the s-l-o-w speed tuning which is so desirable for sideband zeroing. A piece of polystyrene with a ¼" hole, supports the shaft near the plate end.

Holes large enough to provide plenty of clearance for the vernier and panel-bearing shafts must be cut in the front panel of the outer box. The dial-pointer clips over the end of the bearing shaft, while knobs are fastened to the vernier shafts of $C_1$ and $C_2$.

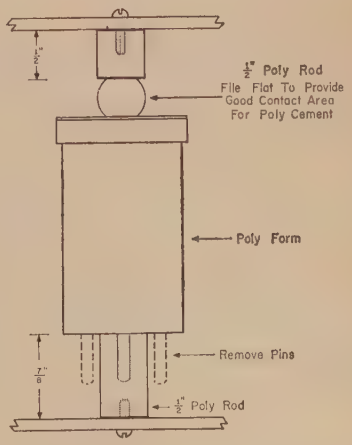
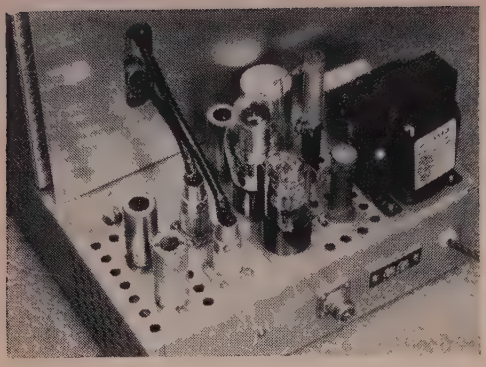



Fig. 4—Details of the construction of inductor $L_1$. Half-inch poly rods are used to "float" the coil between the top and bottom of the inner cabinet. See text.



The "electronics," mounted on a 10" × 14" × 3" steel chassis, is coupled, via two lengths of coax to the inner compartment. The oscillator and doubler are placed at the left and the output 6AU6 is behind the voltage regulator. Connector $J_4$ sits between $V_1$ and the Amperite filament regulator tube. The aluminum heat shield is 7" × 9½".

### *Temperature Compensation*

Although they are less prone to michrophonics than air padders, do not use silver mica or NP0 ceramic fixed capacitors for $C_3$ and $C_4$. Their short term stability is so poor that they will cause the oscillator to lurch back and forth in a random fashion. The effect is sufficiently pronounced to cause a rough c.w. note when multiplying to the higher bands. Temperature compensating capacitors are also subject to this same phenomenon. However, by placing four of them, $C_5$, $C_6$, $C_7$ and $C_8$ in parallel, the irregularities of the individual capacitors are considerably smoothed out.

Capacitor $C_9$ provides a means for varying the amount of negative temperature compensation applied to the tuning components. The greater the capacity of $C_9$, the greater will be the compensation. By carefully adjusting this capacitor, you can almost perfectly compensate the oscillator.

### *Miscellaneous*

Send-Receive relay, $K_1$, should be bolted to a small aluminum plate. Using epoxy glue, fasten the plate to a piece of polyfoam which has been previously cemented to the chassis. This arrangement will effectively silence the already quiet d.c. relay.

An 0A3 gas regulator tube holds the plates and screens of $V_1$ and $V_2$ at a steady 75 volts. An Amperite 6-4 ballast resistor, $R_7$, maintains the heater of $V_1$ at a constant temperature despite large fluctuations in line voltage.

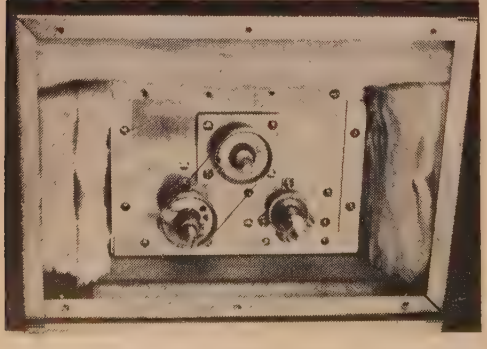
SO-239 chassis connectors, $J_1$-$J_4$ serve as anchor points for the two pieces of RG-58/U coax that electrically join the tuning components with $V_1$. Install PL-259 connectors at both ends of each cable. Absolutely no movement can be tolerated at the tuner end of the coax. Consequently, after the PL-259 connectors have been tightly screwed into $J_1$ and $J_3$, heat the center terminals of these sockets until the PL-259 pins become rigidly sweat soldered to them. This procedure is unnecessary at $J_2$ and $J_4$.

All wiring inside the tuning box should be made with No. 12 or 14 solid wire. Cut the leads of $C_{10}$, $C_{11}$ and $RFC_1$ as short as possible and solder these parts between the pins of $J_1$ and $J_3$ and nearby ground lugs.

Mount $C_3$ and $C_4$ on the side of the tuning box and put $C_9$ on the bottom, behind $C_2$. Don't try to use one large capacitor to replace $C_3$ and $C_4$. Its long shaft, supported by a single bearing, will tend to flop when subjected to vibration.

Coil winding data for $L_3L_4$ in the parts list, is only approximate, since variations in coax length between the v.f.o. and transmitter will affect the resonant frequencies of these two coils.

The key jack will be needed only if you wish to use the v.f.o. as a foundation for a new rig. The jack may be omitted if the unit is to be added to an existing transmitter which already contains provisions for c.w. operation.



Two layers of insulation isolate the inner box from the outer shield. The shaft at the left tunes the variable capacitor, which is coupled, via a pulley arrangement, to the dial pointer. Notice that the dial pulley is mounted outside the chassis, insuring proper mechanical stability.

### *Alignment*

Before tuning up the v.f.o. set $C_9$ at ⅔ capacity, $C_3$ at ⅔ capacity and $C_2$ at about 99% of full capacity. Turn on the a.c. and spotting switch, $S_2$. Adjust $C_4$ until the oscillator's second harmonic is audible on a nearby receiver accurately tuned to 3.5 mc. Now set the receiver dial at 4 mc. The v.f.o. should again be heard when $C_2$ is tuned near minimum capacity. If the oscillator fails to cover the entire range from 3.5 to 4 mc, there are too few turns on $L_1$. It will be necessary to rewind the coil, adding 3 or 4 turns in the process. Once the tuning range is correct, fasten the lid on the tuner box and repeat the previous adjustments. The tuner may now be placed in its insulated housing.

Draw up a dial scale and cement it to the front panel.

The oscillator's drift rate should now be in the order of less than the 18 cycles per *hour*. Unless you possess a stable, accurate 100 kc crystal calibrator, don't try to improve this any further. On the other hand, if you are blessed with a great deal of patience and own a good secondary

[*Continued on page 102*]

The author and his little friends made an excellent background for the official QSL card at Wallis. W4ANE was stateside QSL Manager.

# Six Weeks In The Sun:

# FK8, YJ1, FW8, And VR2

BY WILLIAM R. HEMPEL*, VK3AHO

On Wednesday, 30th May, 1962 I left Sydney, Australia for New Caledonia, the first leg of a great adventure. Just two hours from Sydney I stepped from the giant DC-8 jet into a tropical warmth which was a direct contrast to the winter weather of Sydney.

I was met at the airport by FK8AU, Raoul; FK8AC, Felix; FK8AY, Daniel, who is Raoul's son FK8AX, Louis; FK8AE, John, and FK8AS, Achille. Landing formalities were quickly taken care of and I was soon on my way by car to Noumea some 30 miles away.

Although I had a little trouble with my schoolboy French, the understanding of the people soon enabled me to make myself clear.

The next day I collected the KWM-2 and accessories which had been sent by air to me at Noumea by Cal, W4ANE. Felix, FK8AC did a marvelous job of handling all the customs formalities concerning the equipment.

June 1st, I set up the KWM-2 in Raoul's shack which was only a 5 minute walk from my hotel. I used my Matchbox and Micromatch to load Raoul's windom and vertical. I operated from FK8AU for one week and gave many amateurs their first two-way s.s.b. QSO with FK8.

### New Hebrides

On June 7th I repacked the equipment and next morning I boarded a DC-4 for Vila in the New Hebrides. A pleasant surprise was to find both English and French spoken there. I applied for a license and was given the call YJ1RH. I set up the KWM-2 in my hotel bedroom looking out over the beautiful port of Vila. Temperature averaged about 88°, a little warmer than in New Caledonia.

I erected two windom antennas at right angles to each other, one 90 feet out over the water. I once again used the Matchbox and Micromatch to load the KWM-2 on all bands. Although I worked all continents, conditions in general were very poor and only 800 QSOs resulted during the week.

I met YJ1AA, Frank Palmer, not active at the present, still repairing his antennas from cyclone damage. I also met FU8AF, Robert, who operates mostly on c.w. but will go phone for anyone who can speak French.

June 15th I returned to New Caledonia and again operated from FK8AC and FK8AX on s.s.b. I also had the opportunity to use the 12 volt d.c. transistor power supply for the KWM-2.

### Wallis Island

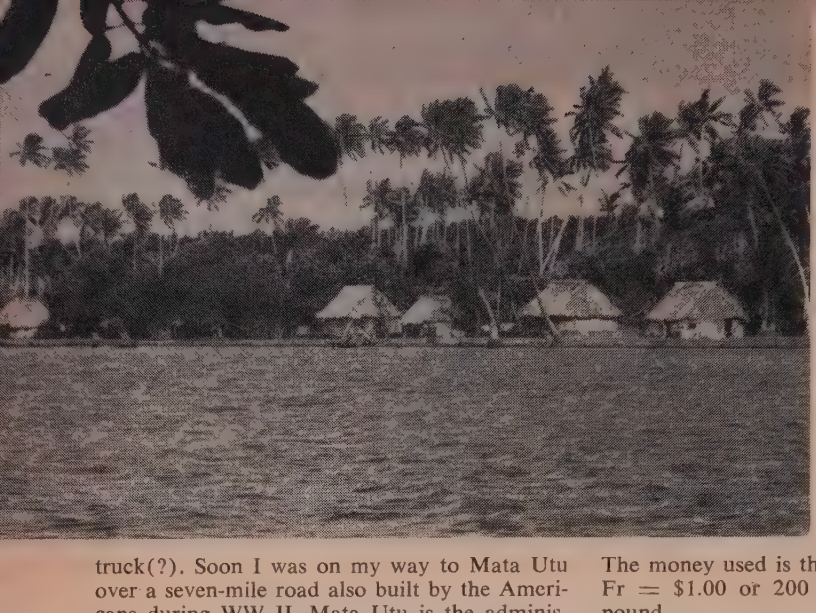
On June 24th I departed from New Caledonia by DC-4 and six hours later we appeared over Wallis Island, a volcanic land formation of approximately 62 square miles surrounded by a coral reef. As the DC-4 touched down on the grass landing strip built by the Americans in 1942, I caught a glimpse of the hundreds of native people who had arrived from all parts of the island to greet the monthly plane.

On stepping from the plane all passengers were presented with a beautiful flower lei and I immediately felt that I was indeed welcome to this island paradise, so remote from our modern way of living.

Now I was on my own, no amateurs to meet me and *no* English spoken. I supervised the unloading of my precious boxes of equipment from the aircraft into an old unlikely looking utility

The operating position at FW8BH during one of the few moments of inactivity. Power was available for only three hours each day. Later a 12 volt d.c. supply was used.

*Rural Delivery, Kyvalley, Victoria, Australia.



Typical Wallis Island housing development, all handi constructed from materials of the coconut palms.

truck(?). Soon I was on my way to Mata Utu over a seven-mile road also built by the Americans during WW II. Mata Utu is the administrative centre for Wallis, but apart from the Governor's residence, the King's two-story stone house and the Cathedral, it is just like any other native village on the island, no shops and no main street.

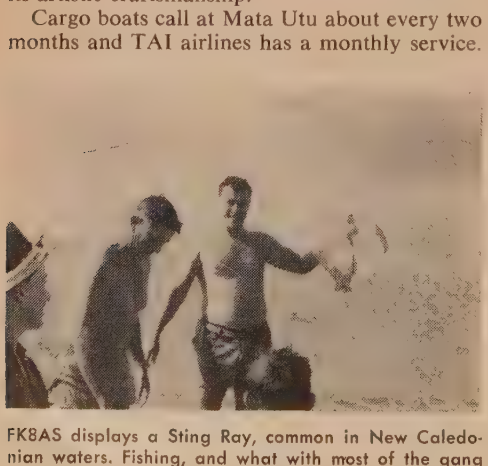
I was taken to a small native bungalow set aside for my use. This building was a special native style house, with woven grass floor, thatched roof and walls covered with tapa. Lighting was from a small kerosene lamp.

The population of Wallis is approximately 6,000 French Polynesian natives who speak a little French but mainly their own language. The main foods are yams, cassava, bananas, paw paw, arrowroot and fish. Education is provided by the missionaries and is subsidized by the French government.

On July 29, 1961 Wallis and Futuna Islands were given the status of independent overseas territories of the French Republic.

The natives are very expert at weaving and making of tapa. Tapa is a bark cloth decorated with geometric designs and is widely known for its artistic craftsmanship.

Cargo boats call at Mata Utu about every two months and TAI airlines has a monthly service.



FK8AS displays a Sting Ray, common in New Caledonian waters. Fishing, and what with most of the gang still needing FK8!

The money used is the Pacific Franc: 100 CFP Fr = $1.00 or 200 CFP Fr = 1 Australian pound.

June 25th I called on the Governor and presented my radio credentials. He immediately authorized my operation with the call sign FW8BH. I proceeded at once to set up my shack at the Post-Office. The local Postmaster gave me a small room (a disused rest room) at the rear of the building as this was the only space available. I at once set about getting the equipment unpacked. My antenna, previous precut, was a multiband wire dipole fed with RG-58/U. 110 volt power was available for my use only three hours daily. Toward the end of my stay I was able to arrange for the use of the battery room. I erected a windom antenna here and operated very successfully with the 12 volt transistor power supply.

My first QSO from FW8BH was on July 25th with VK5AB who had waited for me on 20 for seven hours. From then on the band went wild. the S-meter on the KWM-2 stayed at 20 db over S-9 across the entire American phone band. I was using the external v.f.o. to enable off-frequency listening. QSOs were slow during the first day but gradually improved. Now it was time for c.w. operating and the QRM started all over again.

Conditions were good until July 9th. On the evening of this date, I was all set to work VKs and ZLs on 80 meters. I was using the transistor power supply when at precisely 0900 GMT while in QSO with Jock, ZL2GX on 80, a sharp crack in my receiver followed by a brilliant flash in the northern sky terminated all communication on this band as well as 40 meters. The H-Bomb had been fired over Johnston Island. I walked to the door of the battery room and noticed it was now as light as day outside. I could see the natives running to the Chapel and everyone appeared to be terrified. In the north a white band of light extended over Wallis Island around to the south, terminating in a fiery glow. After ten minutes the red glow extended to the north and the whole sky gradually turned to a pal

[*Continued on page 102*]

# The Mark III DX Antenna

BY COMMANDER PAUL H. LEE*, W3JHR

*Here is a vertical antenna, 50 feet tall and self supporting, for the 80, 40, 20 and 15 meter bands. Its low angle of radiation makes it ideal for DX operation.*

THIS antenna has proven itself with such success that it seems worth passing on to those who would like to build a colinear vertical. The antenna was originally intended for use only on 14, 7, and 3.9 mc, but I have found that it can be successfully used on 21 mc as well. I do not as yet know what its vertical pattern is on 21 mc, nor do I know what its current distribution is.

## Antenna Operation

### 14 MC Operation

The Mark III antenna is 50 feet tall, and is grounded at its base. It would have been impractical to make this taller and heavier mast self-supporting and still insulated at the base like the Mark II, so I decided to ground it and shunt feed it with several feed rods. Basically it is one half of a three-element center-feed colinear on 14 mc, as can be seen in fig. 1. (The mirror image below ground is the other half.) A three-element colinear has a gain of 3.2 db over a dipole. Replacing the bottom half with a ground plane and putting all the power into the upper half gives an additional 3 db gain. The current distribution on this antenna is as shown in fig. 1. The phase reversal at the point a quarter-wave above ground can be accomplished in several ways, by a shorted quarter-wave stub, a tuned circuit, or a quarter-wave coaxial sleeve. The latter is shown in fig. 2. This design is used quite commonly at v.h.f. and u.h.f., where size permits several elements with coaxial sleeves to be stacked vertically. The phase reversal occurs at the open or bottom end of the coaxial sleeve. Inasmuch as the current loop in the bottom portion of the mast occurs at ground level, the bottom end can be grounded and fed with a shunt or "gamma" type of feed, as shown in fig. 2. The vertical pattern over ground of average conductivity at 14 mc is also shown in fig. 2. Note that the pattern is "squashed" down, with most of the power going out at angles from about 3 to 22 degrees. This is ideal for DX work because it places the first reflection zone out at a distance of from 1100 to 2100 miles.

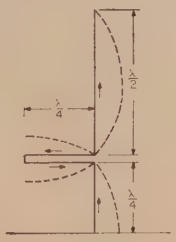



Fig. 1—on 14 mc, the antenna operates as one half of a 3 element center fed colinear. Also shown is the current distribution. The mirror image below ground constitutes the second half of the antenna.

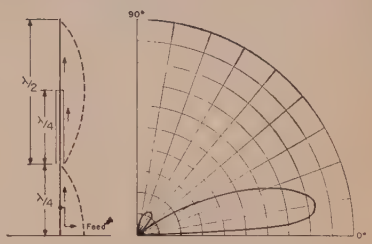



Fig. 2—Phase reversal is accomplished by the use of a coaxial sleeve rather than the stub shown in fig. 1. The resulting vertical radiation pattern is shown.

### 7 MC Operation

On 7 mc the coaxial stub is too short to

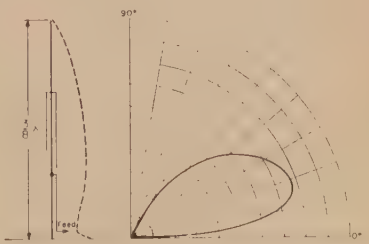



Fig. 3—Since the coaxial stub will not resonate at 7 mc the antenna behaves as ⅜ wave vertical and presents the radiation pattern shown above.

*5209 Bangor Drive, Kensington, Maryland.

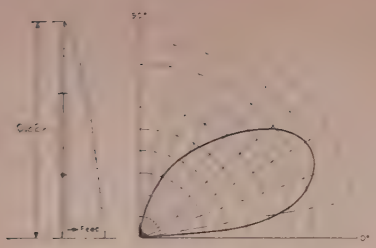


Fig. 4—The coaxial stub has no effect on 3.9 mc operation and the antenna acts as 0.22 wavelength unit with the vertical radiation pattern shown.

resonate, and it has little if any effect on the current distribution or the vertical pattern. The antenna behaves as a ⅜ wave vertical, whose vertical pattern over average earth at 7 mc is shown in fig. 3. Here again we can feed this antenna with a shunt or "gamma" feed, as shown. Note that this antenna's pattern is useful for angles of about 5 to 45 degrees, which is good for medium and long distance work on 7 mc.

### 3.9 MC Operation

On 3.9 mc the stub again has no effect, and the current distribution is shown in fig. 4. At this frequency the antenna is 0.22 wavelengths tall. The vertical pattern is also shown. Useful power is radiated over vertical angles from 8 to 60 degrees, making this antenna good for short, medium, and long distance work on 3.9 mc. Here again the mast can be fed against ground with a "gamma" type feed rod. There is only one problem at 3.9 mc, and that is the "Q" of the antenna. It is slightly too short to be self-resonant (not quite a quarter-wave), and therefor the impedance looking into the bottom of the feed rod is in the order of 9 + j110 ohms. This is with the feed rod connected at the highest possible place on the bottom of the mast, just below the open end of the stub. The "Q" is about 12. With the matching network (to be described later) adjusted to give a v.s.w.r. of 1 at 3.9 mc, the v.s.w.r. rises to about 1.7 at 3.8 and 4.0 mc. This is not too bad, however, and can be easily compensated for in the output pi-network of the transmitter. On 7, 14, and 21 mc, however, the v.s.w.r. is a flat 1 over the whole band.

## Mast Construction

The dimensions of the mast are shown in fig. 5. The bottom section is a 20 foot length of 4" aluminum irrigation pipe, of which four feet is set in the ground. The next section is a 20 foot length of 3" irrigation pipe, with 30" of this telescoped into the top of the bottom section. The third piece is 10 feet of 2" irrigation pipe, with 18" telescoped into the top of the 3" piece. The top section is a 9 foot length of 1½" tubing, which is telescoped 12" into the top of the 2" piece.

The telescoped junctions are made as shown

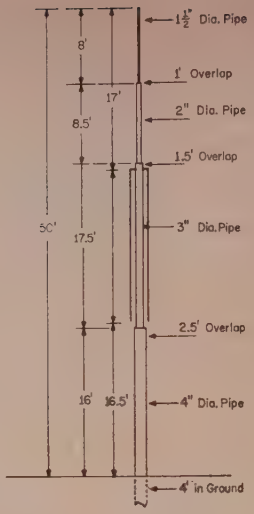



Fig. 5—Dimensions of the antenna sections showing lengths, overlaps and location of the coaxial sleeve.

in fig. 6, by using some hardwood shims which are planed down to the proper shape, wrapped with thin sheet aluminum, and are held in place by four large bolts which pass through the junction (two bolts at right angles to the other two). Bolt sizes are shown in the table in fig. 6.

The coaxial sleeve is hung around the 3" section. It is 16.5 feet in length, and is shorted to the mast at its top and is open at its bottom. Feed rod dimensions are shown in fig. 7. The 3.9 mc feed rod, which is connected to the mast at a point just below the open end of the sleeve, is also used for the 7 mc feed by switching matching networks. The 14 mc feed rod is connected to the mast about 8 feet from the ground. The connecting point for the 21 mc feed rod was found by experimentation to be about 4.5 feet from ground. The three feed rods are made of 1" aluminum tubing, and are connected to the mast by brackets of aluminum strap at their upper ends, and are held by standoff insulators

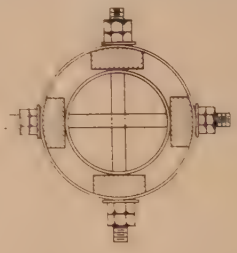


Fig. 6—Cross section of the junctions showing construction and positions of the hardwood spacers. The hardwood blocks are wrapped with thin sheet aluminum. Bolt sizes for each junction are as follows:

| *Junction* | *Bolt Size* | |
|---|---|---|
| 4" to 3" | (3) ½" × 7" | (1) ½" × 12" |
| 3" to 2" | (3) ⅜" × 5" | (1) ½" × 12" |
| 2" to 1½" | (2) ¼" × 4" | |

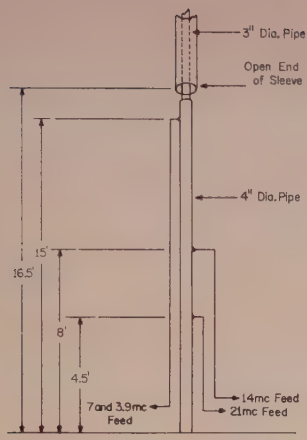



Fig. 7—Location of the feed lines for each band.

at their bottom ends. Details of these fittings follow in a later paragraph. Switching between feed rods to change bands is done in the tuning unit at the base of the mast. Those who read the articles on the Mark II antenna will recognize this tuning unit box and its wood post, which has been cut off short.

## Coaxial Sleeve Construction

Now let us see how the coaxial sleeve is made. It is a simulated coax, or cage, with six peripherial wires as shown in fig. 8. It has a 9½" diameter. The no. 9 aluminum clothesline wires are strung taut, with four spreader rings made of aluminum strap. The top and bottom rings are made of ¼ × 1" strap, and the two middle rings are made of ⅛ × ¾" strap. This material is of the Reynolds "do-it-yourself" variety available in many hardware stores, in 6 or 8 foot lengths. The brass ¼-20 nuts and bolts are also easily obtainable. A little trick is used in securing the wire under the nuts. Instead of turning the loop in the wire clockwise around the bolt under the nut, the loop is

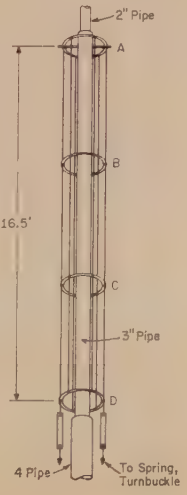



Fig. 8—Construction details for the coaxial sleeve. Six lengths of #9 aluminum wire form the cage and are held in place on the aluminum rings by ¼-20 × ¾" brass screws and nuts. Rings A and D are made from ¼" × 1" aluminum with a 9" i.d. Rings B and C are made from ⅛ × ¾ aluminum with a 9¼" i.d. The two bottom brass bolts to which the 12" Johnson insulators (#136-112) are attached, measure ¼-20 × 1¼".

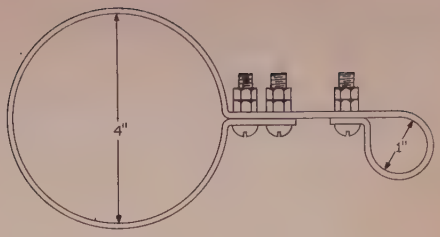



Fig. 9—Construction details for the upper connecting clamps for the feedlines. They are fabricated from ⅛" × ¾" aluminum strap and held together by ¼-20 × 1" brass screws. Three straps are required.

turned counter-clockwise. This brings the wire out on the right hand side of the bolt, and when tension is put on the wire it tends to turn the nut clockwise and tighten it. This prevents the nuts from working loose. The open end of the sleeve is pulled off by means of a pair of heavy springs and turnbuckles, with an E. F. Johnson type 136-112 12" strain insulator in series with each. The top ring of the sleeve is held securely in place by double nuts on the 12" long ½" bolt which passes through the mast joint. The turnbuckles at the bottom are similarly fastened to the 12" long ½" bolt which passes through the lower mast junction. This is shown very clearly in the accompanying photograph. The sleeve is kept under considerable tension by means of the heavy springs, with the turnbuckles turned down to their limits.

## Feed Line Construction

The connecting clamps for the upper ends of the feed rods are shown in fig. 9. There are three of these, made from ⅛ × ¾" aluminum strap, with ¼-20 brass hardware. After the final adjustment, double nuts are used to prevent the bolts from working loose. Figure 10 shows the design of the mounting ring for the bottom insulators of the feed rods. This ring fits on the mast about 18" above ground level.

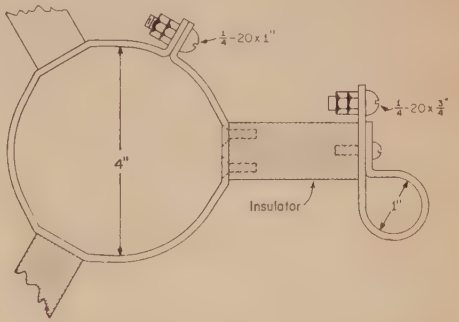



Fig. 10—Base mounting ring for the 3 feed lines. It is constructed from ⅛ × ¾" aluminum strap. The area beneath the 1⅛" × 1⅛" × 2½" insulators are flat for solid support. The tubing clamps (3) are also fabricated from ⅛ × ¾" stock. The hardware is brass of the dimensions shown.

The insulators are of a surplus type, square in cross-section and 2½" long. I obtained them as part of some large s.p.d.t. knife switches which I bought from Barry Electronics, 512 Broadway, New York City at 80¢ each. Each switch has three of these insulators, and I bought enough to give me a good stock of these handy items. Insulators made by Millen or E. F. Johnson could be substituted.

The aluminum strap is flattened beneath each insulator, as shown in fig. 10, to give a smooth bearing surface for the insulator. There is a similar strap, made to mount only one insulator, which is used to brace the middle of the 13 foot 7/3.9 mc feed rod to keep it from vibrating in a wind.

Figure 11 shows the detail of the heavy ground clamp used at the base of the mast. It is made of the ¼ × 1" strap, and is held tightly around the 4" mast by means of the ¼-20 bolts with double nuts. It is placed about 4" below ground level, and is used as the tie point for a piece of the ¼ × 1" strap which serves as the ground bus to the tuning unit and as the connecting point for the twelve buried ground radials. The 12 radials are of the No. 9 aluminum wire and are pushed into slots in the sod to a depth of about 3". Two of them are over 60 feet long and the others vary in length from 35 to 50 feet, fitting within the limits of the property. The coaxial feed cable and the relay control cable are buried from the house to the mast. The coaxial line is RG-8/U, and the control cable is plastic-covered electrical cable designed for direct burial. As much of the original Mark II setup as possible was used without change.

## Assembly

This antenna mast was put together on the ground, the sleeve was fastened in place, all bolts tightened, and then it was raised easily by three people, and set in a 5" post hole drilled with a post hole borer. It was a bit awkward to handle because of its 50 foot length, but was not heavy, weighing no more than 30 to 35 pounds. It is quite strong in spite of its 50 foot height. During the 50 knot wind experienced shortly after its erection, the top of the mast bent over about 8 feet out of plumb, but when the wind died there was the mast, as straight as before. The movement of the sleeve in normal winds has no effect on loading.

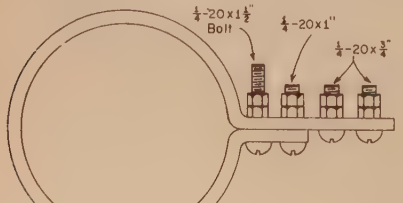



Fig. 11—Ground clamp details used to connect to the radials and the tuning unit. It is made from ¼ × 1" aluminum stock and furnished with brass hardware.

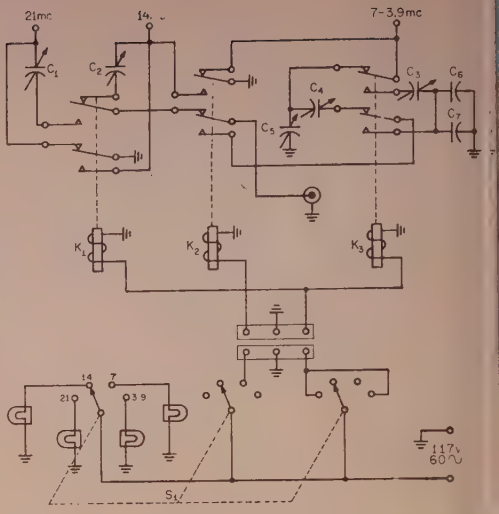



Fig. 12—Circuit of the tuning unit used to feed the Mark III Colinear vertical. The control circuit is connected to the remote tuning unit by underground plastic cable.

$C_1$, $C_2$, $C_4$—110 mmf vacuum variable.
$C_3$—750 mmf vacuum variable.
$C_5$—150 mmf Air variable.
$C_6$, $C_7$—0.0011 mf 5 kv micas. Sangamo type F-2 or equiv.
$K_1$, $K_2$, $K_3$—D.p.d.t. relay 117 v.a.c. coil. Ameco type 51 or equiv.

## Tuning Unit Adjustments

The operating sequence of the tuning unit relays is as follows:

| *Freq.* | $K_1$ | $K_2$ | $K_3$ |
|---|---|---|---|
| 21 mc | on | off | on |
| 14 mc | off | off | off |
| 7 mc | off | on | off |
| 3.9 mc | on | on | on |

On 3.9 mc I am using a simple "L" network, with 03 in series with the + j110 ohms feed point reactance, adjusted to leave about + j20 ohms of $X_1$ in the series arm of the "L", with fixed capacitors $C_6$ and $C_7$ as the shunt arm. The input impedance is 51 + j0 ohms at the connection to the coaxial line. On 7 mc the relays cut in an "Omega" match, consisting of two variable capacitors, $C_4$ and $C_5$. $C_5$ is the shunt arm of the "Omega" from feedpoint to ground, and $C_4$ is the series arm leading to the coaxial line. On 7 mc the input impedance of the feed point is more favorable. Again, the input impedance is adjusted to 51 and j0 ohms. On 14 mc, the connection point of that feed rod to the mast was adjusted, and $C_2$ was tuned to give an input impedance of 51 + j0.

ohms. On 21 mc the same thing was done using the length of the 21 mc feed rod and capacitor $C_1$ to obtain 51 plus j0 ohms. Relay control is by means of switch $S_1$ on the operating desk, as described in the January 1961 article. Back contacts on the relays are used to ground unused feed rods. This was especially necessary in the case of the 7/3.9 mc feed rod, as a match could not be obtained on either 14 or 21 mc with it floating.

One might get the impression from the preceding paragraph that a General Radio R. F. Bridge is necessary for tuning up. It certainly is a very handy tool, because it enables one to read accurately both the magnitude and sign of reactance and the magnitude of resistance, for each change in tuning. However, it is not an absolute necessity. One may use an s.w.r. meter, inserted in the coaxial line right at the input to the tuning unit. This must be an s.w.r. meter which will handle power, however, as adjustment of the variable capacitors is done with the transmitter on and feeding r.f. power to the antenna. This is really a two-man job, with one person at the transmitter to turn it on and off for stub adjustments. He must also see that adjustments being made at the tuning unit do not cause overload at the final amplifier. In my own case, I did not care whether the 4-1000A, running at low voltage and about 100 watts input, went out of tune or not, as long as I was able to get enough output for s.w.r. meter readings. The 4-1000A could not be hurt at all under such conditions. However, the proud owner of a sensitive pair of 6146's would not be so fortunate, and should have someone standing by the transmitter to retune the final tank if required!

An appropriate type of s.w.r. meter is the "Beercan S.W.R. Indicator" described on page 96 of November 1957 *CQ*. There is also a good one on page 736 of the *Radio Handbook*, 15th Edition. These two are designed to read s.w.r. under power.

Using the s.w.r. meter, adjustment will take longer than with an r.f. bridge, because it is more of a cut-and-try operation. At high values of s.w.r. it is quite difficult to detect the results of changes in tuning. For example, a reactance change from +j175 to +j150, while appreciable and in a favorable direction, would show very little change on the s.w.r. meter. Or, a change from +j50 to –j50 in reactance, with the $R$ term remaining about the same, would not show up on the s.w.r. meter as a change unless one passed through the j0 point slowly in the tuning process. However, don't give up hope at this point. The job can be done with an s.w.r. meter and some patience and care.

In fact, the next tuning unit I build will contain a built-in s.w.r. meter as a permanent fixture, with provision for shorting out the sensitive microammeter for its protection when not in use.

### Performance

The Mark III has provided many excellent DX contacts on 14 mc, which it was designed to do, and it has outperformed nearby Yagis in laying down strong signals in overseas places like Europe and Australia. On 7 mc it gives very strong signals over the whole of the United States and Canada, depending on skip conditions, and has provided many excellent DX contacts at night. It is useful on 3.9 mc for short-range daytime contacts out to 500 or 750 miles, and at night it reaches out to the West Coast and Europe with no trouble at all. Being able to use it on 21 mc was an unexpected bonus. I had not originally so intended, and I have no idea of the current distribution nor vertical pattern shape on the 21 mc band. However I plan to make an actual vertical pattern measurement on all bands at an early date. This is not hard to do with the antenna in place and connected normally.

For those of you who care to write for further information, please enclose a stamped envelope. ■

## NEW YORK GETS CALL PLATES

Left to right, W2AAO, K2SJO and Gov. Rockefeller.

HOWARD MAGUIRE, W2AAO, (left) who for almost ten years pioneered the adoption of call-letter license plates for New York State amateurs is shown receiving his personal plate from Governor Nelson Rockefeller during the Hudson Amateur Radio Council's Convention held at the Statler Hilton Hotel in N. Y. C. on October 13th. Through Howard's extensive efforts, N. Y. amateurs will display plates for the coming year. Stan Zak, K2SJO, HARC Convention Chairman seems quite pleased with the goings on. Kentucky, Massachusetts and New Jersey remain to be convinced.

# Three Tubes on Three-Quarter Meters

BY FREDERICK W. BROWN*, W6HPH

Crystal control at 432 mc with a minimum number of stages made possible by use of diode multiplication.

SOME years ago, I constructed a 432 mc crystal controlled transmitter using just three single purpose receiving tubes. Although many enjoyable contacts were made, the best output attainable was barely 50 milliwatts. The rig described here puts out five times that much power without increasing the number of tubes, the power supply drain, or the crystal frequency. Credit for this remarkable improvement goes largely to the use of diode frequency multipliers.

### Circuit

The circuit uses an inexpensive 8 mc crystal working on its fundamental (not an overtone) and the final runs straight through at 432 mc instead of multiplying. Although the output (0.25 watt) is not quite sufficient for crushing rocks, it can give a very good account of itself if used with a high gain antenna. The unit may also be used as an exciter for a higher power final such as a 2C43 or 6939.

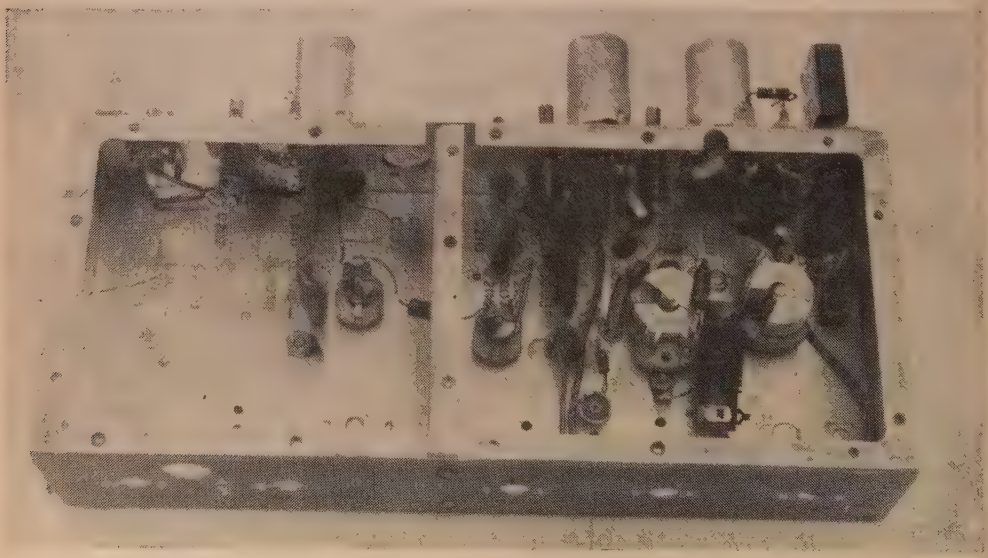
Readers of *CQ* will recognize the first two stages (fig. 1) as being very similar to the diode multiplier rig previously described.[1] The 24 mc output of the oscillator is multiplied 6 times by the diode $CR_1$ to 144 mc and the second stage amplifies straight through at 2 meters. The frequency is then tripled by $CR_2$ and the resulting 432 mc signal is amplified by the 6AK5 final.

A pentode oscillator is used instead of the triode circuit shown in the previous article. It proved to give every bit as much output as the 6C4 and requires one less tuning adjustment. A tube substitution is not recommended for the oscillator; although practically any pentode will work, the 6AK5 was found to give much better 24 mc output (at even less input) than any other inexpensive receiving tube. Because of its lower input conductance due to shorter transit time, the 6AK5 is probably the best choice for the other two stages as well.

One problem encountered that was not noticed in the earlier model was difficulty with diode heating. There is a slight warming of the diode due to r.f. current flowing in it and after a few seconds of operation the resulting change in junction capacitance causes a detuning of the associated tank circuits. This detuning may be circumvented by any of a number of methods such as use of high-$Q$ diodes, operation at a lower power level, etc. In this case the problem was completely overcome by simply paralleling

*Star Route, Idyllwild, California.

[1]Brown, F. W., "Diode Multipliers In V.H.F. Exciters," *CQ*, March, 1962, p. 36.



Inside view of the 432 mc transmitter. The chassis is surplus. Oscillator stage is at the right and final to the left. The shield partition separates the two 432 mc tuned circuits, $L_7$ and $L_8$.

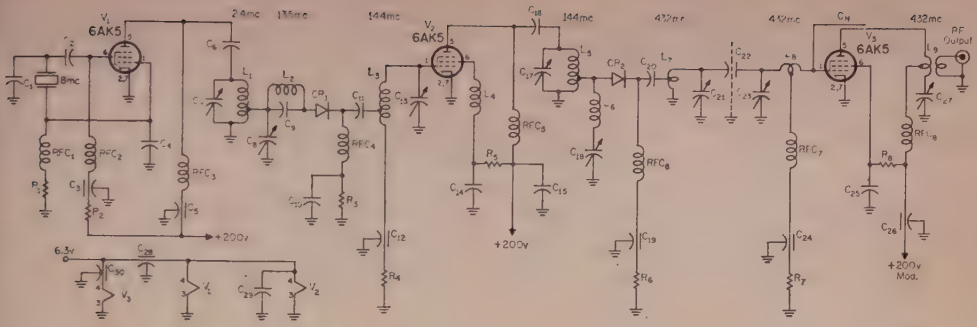



Fig. 1—Circuit of the 3 tube 432 mc exciter-transmitter capable of a quarter watt output. All resistors are ½ watt. Resistors $R_4$-$R_6$ and $R_7$ are mounted external to the shielding for convenience in testing.

$C_1$—10 mmf ceramic.
$C_2$, $C_6$—1800 mmf, ceramic.
$C_3$, $C_5$, $C_{12}$, $C_{19}$, $C_{24}$, $C_{26}$, $C_{28}$, $C_{30}$—.001 mf ceramic feedthrough.
$C_4$—8 mmf ceramic.
$C_7$—50 mmf APC.
$C_8$—20 mmf APC.
$C_9$—22 mmf ceramic.
$C_{10}$, $C_{14}$, $C_{15}$—500 mmf button.
$C_{11}$, $C_{16}$, $C_{20}$, $C_{29}$—56 mmf ceramic.
$C_{13}$, $C_{17}$, $C_{21}$, $C_{23}$, $C_{27}$—2-9 mmf Johnson miniature.
$C_{18}$—0.5-10 mmf piston.
$C_{22}$—1 mmf ceramic.
$C_{25}$—10 mmf ceramic.
$C_n$—Neutralizing capacitor. See Text.
$CR_1$—Three 1N270's in parallel.
$CR_2$—Two DR-303's in parallel.
$L_1$—15 turns #18 e. ½" dia. form ¾" long. Tap six turns from ground.
$L_2$—3 t. #22 e. ¼" dia. air wound.
$L_3$—4 t. #18 e. 5/16" dia., ⅜" long, tap 1 turn from top.
$L_4$—2¼" of #18 e. See Text.
$L_5$—3½ t. #18 e. 5/16" dia., 5/16" long. Tap one turn from ground.
$L_6$—1½" of #18 e. bent into U shape.
$L_7$—1¾" of #16 e. bent into U shape. Tap ½" from top.
$L_8$—1¾" of #16 e. bent into semicircle. Tap ½" from $C_{23}$.
$L_9$—2¾" of #16 e. bent into U shape. Tap 1½" from plate. Output link: 1¼" #18 plastic covered, U shaped.
$R_1$—47K.
$R_2$, $R_5$, $R_8$—15K.
$R_3$—33K; See Text.
$R_4$—22K.
$R_6$—470K; See Text.
$R_7$—33K.
$RFC_1$, $RFC_2$—100 μh video peaking coil.
$RFC_3$—50 μh, 3 pie choke.
$RFC_4$, $RFC_5$—18 t. #20 e. ¼" dia. ¾" long, air wound.
$RFC_6$—5 t. #20 e. 5/16" dia. ¼" long, air wound.
$RFC_7$—1¾" #20 e. bent into U shape.
$RFC_8$—5 t. #26. e. 5/32" dia. ¼" long, air wound.

diodes. Three diodes are used for the first multiplier, and two are used for the 144 to 432 mc tripler.

Self bias, provided by $R_3$ and $R_6$, is used for the diode multipliers. The optimum value of these biasing resistors will depend on the individual diodes used and should be empirically determined by substituting a 500K pot.

Although the screen grid reactance method of neutralization is used for the 144 mc stage, it proved unsuccessful at 432 mc; and so the method shown in the schematic was used to neutralize the final. Increasing grid to plate capacity may seem like a backward way to neutralize an amplifier, but that's the way it works at 432 mc. The theory was explained in *CQ* in 1961.[2]

Some difficulty was encountered with a 144 mc component in the 432 mc output of the tripler. Use of series tuning in the final grid circuit offered little discrimination against this 144 mc component and there was also some inductive pickup directly from $L_5$. These difficulties were overcome by using two 432 mc tuned circuits separated by a shield and capacitively coupled through $C_{22}$.

[2]Orr, W. I., "Transmitting Tubes—How To Use And Abuse Them," Part II, *CQ*, Dec., 1961, p. 32.

### Construction

This particular version was built on a 4½" × 10½" × 2" junk chassis, but anything that offers enough space should be suitable. Layout the chassis to provide short r.f. leads, particularly in the 432 mc stage. Complete shielding of the 432 mc circuits is desirable to prevent radiation losses. It's also a good idea to use feedthrough bypass capacitors on all entering power leads to prevent r.f. being lost due to radiation from the wires. Resistors $R_4$, $R_6$, and $R_7$ are placed outside the chassis to permit easy measurement of the voltages across them.

Shields are used across the two amplifier sockets, isolating pin numbers 1 and 2. Each shield is grounded as close as possible on both sides of the socket, and pins 2, 3, 7, and the center post are soldered directly to the shield.

The r.f. chokes used for shunt feed of the first two stages ($RFC_3$ and $RFC_5$) should be high $Q$ and some experimentation with different chokes may help bring up the drive. Substitution of a 2.5 mh choke for $RFC_3$ resulted in substantially reduced output as measured across $R_4$. The choke finally selected was a 3 pie job having an inductance of about 50 μh.

Notice the inductance values used for $RFC_7$

and $RFC_8$. It is always good practice to use vastly different inductance values for grid and plate r.f. chokes in series tuned (or push-pull) amplifiers because it eliminates any possibility of tuned-plate tuned-grid oscillation at the r.f. choke resonant frequency.

**Adjustment**

First step in tuning up is to check the various tuned circuits with a grid-dip meter. After setting to the approximate frequencies indicated in fig. 1, apply 200 volts to the oscillator only and check with your receiver to make sure it is crystal controlled at 8 mc. Then tune in the 2 meter harmonic and adjust $C_7$, $C_8$, and $C_{13}$ for maximum S-meter reading. You should now have some grid current in the second stage as measured with a v.t.v.m. across $R_4$. Maximize this voltage by peaking all first multiplier adjustments ($C_7$, $C_8$, $C_{13}$, $L_2$, and $R_3$). There will be more than one peak on $C_8$, so use the setting of greatest output. Inductor $L_2$ is adjusted by squeezing or spreading the turns.

When convinced you have the maximum attainable voltage across $R_4$ (you should end up with more than 8 volts), you're ready to neutralize the second stage by adjusting the screen inductance. This inductor, $L_4$, is an L-shaped piece of #18 solid wire about 2¼" long running between the screen (pin 6) and $C_{14}$. It is adjusted by shortening a little at a time until the stage is properly neutralized. If you want a more convenient arrangement, you can use the series tuning method described in the earlier article, or substitute a slug-tuned coil for $L_4$. Neutralization is not critical, however. The output of $CR_2$ as measured across $R_6$ with a v.t.v.m. makes a convenient neutralizing indicator. With no plate or screen voltage on the second 6AK5 but with $C_{17}$ tuned to resonance, this rectified r.f. voltage should be less than 0.2 volt with the stage properly neutralized.

When these adjustments are completed, plate and screen voltage may be applied to the second stage, and the 432 mc harmonic tuned in on a receiver. Components $C_{21}$, $C_{23}$, $C_{17}$, $C_{18}$, and $R_8$ are then tuned for maximum S-meter reading and maximum voltage across $R_7$. This voltage should be more than 7 volts with no B plus on the final.

The final amplifier neutralizing "capacitor" is a ½" length of #20 plastic covered hook up wire soldered to the grid (pin 1) and running under the shield over near the plate pin. The spacing is adjusted for proper neutralization. Only a very small amount of capacity is needed. For a neutralization indicator you can use a diode and meter connected to the output jack or use the time honored method of adjusting for minimum grid current "wiggle" as the plate is tuned through resonance.

With the final neutralized, screen and plate voltage may be applied and everything peaked for maximum output to the antenna or dummy load. About 1.25 watts of audio will fully modulate the final and linearity is good.

With the rig connected to a 24 ele. array here in southern California, good signal reports have been received at distances up to 100 miles. ■

# LUØAC Temporarily QRT

THE well known maritime mobile station, LUØAC, active since 1951 aboard the passenger ship, the *Rio Jachal* will be temporarily QRT.

A tragic fire aboard the *Rio Jachal* on the evening of Sept. 28th has totally destroyed the amateur radio station of the chief radio officer, Ruben Compiani, while in the port of New York. LUØAC is well known in amateur circles for rendering much assistance in passing emergency traffic, *e.g.* assisted in relaying medical information from the ship to Bahia, Brazil (the nearest port) which possibly saved the life of a very sick patient aboard the *Rio Jachal*. For this meritorious service, a medal was awarded him by the Argentine State Line. Further, he is extremely active, offering certificates (in six colors), via the Radio Club of Argentina, to all radio amateurs who have established seven contacts in each hemisphere with his station. Approximately 100 certificates have been issued to date. An examination of all the logs of LUØAC (now operating as LU4AC) disclosed 14,356 QSOs made.

The equipment destroyed in the fire consisted of: a Central Electronics 100V, HQ-170 receiver, 1 kw linear amplifier, Heath Cheyenne, Johnson T-R switch, Hy-Gain vertical, *etc.* and the most treasured DX QSL cards which were on the bulkheads of the shack. ■

Thoroughly gutted by the fire on board, the radio room of the S.S. Rio Jachal stands as a total loss. Also a total loss is the maritime mobile station of Chief Radio Officer Ruben Compiani, LUØAC.

# Economy Transistorized Modulator

BY VAUGHN D. NOGLE*, W5TJT

*This transistorized modulator utilizes standard filament and output transformers in a class B circuit. It can produce about 18 watts of output and is easy on the mobile electrical system because of its low idling current*

THE modulator shown in the accompanying schematic takes advantage of the 12 volt battery systems used in automobiles of recent years. The modulator uses high wattage transistors in a class B circuit with virtue of low idlying current. With current input peaks of two amperes at twelve volts, about 18 watts of audio can be obtained in the output. The transformers used are reasonable in cost. Power transistors of large power capabilities are now available for less than power tube prices.

## Circuit

The most interesting feature of this modulator is the method of drive for the class B transistor circuit. Some experimenting with various methods of drive came up with the circuit shown.

The microphone used is an F1 carbon or similar type. The mike voltage is taken directly from the car battery through a voltage dropping resistor $R_1$, 300 ohms, in series with the 48 ohm primary winding of $T_1$. Actually it is an output transformer, used in this circuit as a driver transformer. The current flow in this circuit is about 35 ma. The series resistor, $R_1$, is bypassed by a large capacitor (100 mf 15 volts) to provide a good solid audio path for the carbon microphone input circuit.

The secondary of $T_1$ has to provide power to the class B transistors. The peak to peak voltage to the bases of the 2N277 transistors, at 25 watts, is about one volt. Transformer $T_1$ is connected with the 3.2 ohm point as center tap.

Resistors $R_2$, $R_3$ and $R_4$ provide the proper operating divider for the transistors. With a 12 volt auto battery, $R_4$ is adjusted to .2 ohm and provides about 250 ma idling current in the emitter-collector circuit. During modulation, voice peaks will draw one to two amperes.

The modulation transformer, $T_2$, is a UTC S-55 filament transformer. The 6.3 volt winding is connected to the collectors of the transistors with the center tap connected to the minus terminal of the battery. The 115 volt winding of the filament transformer is connected to the r.f. plate load circuit.

The transistors must be mounted with the proper heat sinks to prevent overheating.

## Testing

When testing the modulator it is absolutely necessary that a load be provided for the output. A 5K 10 watt resistor can be used. Another method is to reverse connect another filament transformer, primary to primary and the 6.3 volt winding to the voice coil of a speaker capable of handling the power.

Be sure, also, to observe the battery polarity carefully or you will be purchasing two new transistors. ■

*11721 Clifford N.E., Albuquerque, N.M.

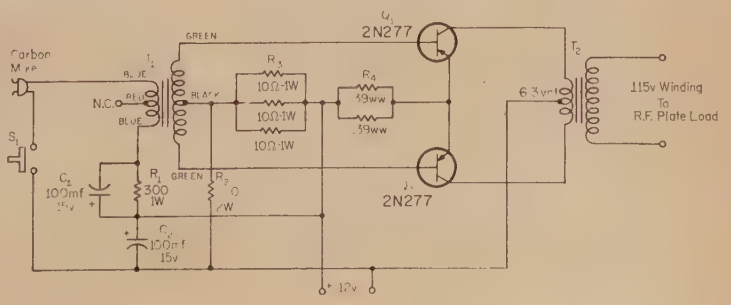



Fig. 1—Circuit of an inexpensive transistorized modulator. $T_1$—48 ohm c.t. to 0/3.2/16 ohm Stancor TA-56 transistor output transformer. $T_2$—115 v. to 6.3 v.c.t. at 3 amps. UTC S-55.

# SHADOW RECEPTION

BY DR. ROBERT E. KELLY*, W5CYG

*The diffraction of radio waves at low frequencies has not been very well appreciated by amateurs as well as physicists. This article clarifies the problem giving illustrations for 80, 15 and 2 meters.*

RECENTLY the club station at the University of Mississippi, W5YE, was requested to furnish communications for a student body function to a park about twenty miles from the campus. Unfortunately this park is located behind and below a long dam, and of course the usual question arose as to what band and antenna polarization would be suitable in order to project a maximum signal to the receiving station. These questions were also of interest to the writer a few years ago when he was operating K7WBG at Yuma, Arizona behind a row of hills.

The problem of transmission and reception behind barriers, such as hills and buildings which are opaque to radio waves, is certainly a common situation, and an elementary understanding of the phenomenon, coupled with a few simple facts, could have an important influence on a choice of bands and perhaps antenna location and polarization. Apparently very little of this topic has been discussed as applied to amateur radio.[1] It is the purpose of this article to describe the influence of wavelength, antenna position, and polarization on signal strength behind a long row of hills (or our dam) with mention of reception behind tall buildings. Our purpose is not to present a detailed picture, but is just to arrive at some overall effects and rules of thumb. Suppose we begin by describing the geometry and simple theory.

### *Theory*

Figure 1 shows a receiving station, $R$, located a distance $b$ behind, and a depth $d$ below, the top of the hill, and at an angle $A$ measured with respect to the horizontal at the hill top. We now imagine plane waves, shown by the straight vertical lines, which originate at a distant transmitter to the right. We notice that at any depth below the top of the hill, the receiving antenna cannot "see" the transmitting antenna, so that we are then in the *shadow region*. If radio waves were always to travel in straight lines, the signal strength (roughly an S-meter reading) would drop abruptly from what would be a full value just above the hill to zero as we move into the shadow region. The effect of "bending" waves around an opaque obstacle, that is, the departure from straight line propagation, is called diffraction. Our problem is to determine the nature of this diffraction which, by the way, also occurs for sound waves.

While the mathematical analysis of the particular problem is quite complex, the end result can be put into simple physical terms. In the shadow region the entire signal is propagated just as if it originated from a fictitious horizontal long wire antenna at the top of the hill and parallel to the long edge (perpendicular to the plane of fig. 1). This antenna produces a cylindrical wave (shown by concentric circles) whose amplitude or field strength changes with the angle $A$ in such a way that it is a maximum when $A$ is zero (the forward direction) and decreases as $A$ increases. Thus reception in the shadow region is due entirely to the fictitious antenna which is excited during the passage of the incident plane wave.

It may be of some interest to note that above the hill, which we may call the illuminated

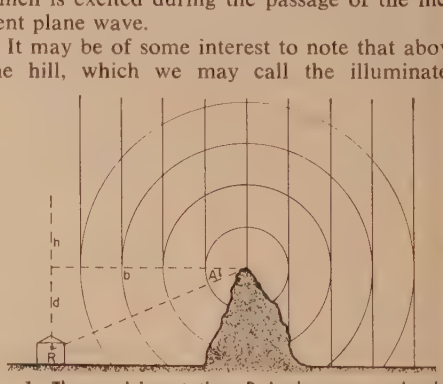



Fig. 1—The receiving station, $R$, is shown at a depth $d$ below, and a distance $b$ behind the hill-top. The straight vertical lines indicate a plane wave advancing from right to left. The circles indicate a diffracted cylindrical wave originating at the top of the hill. See Text.

*Physics Department, University of Mississippi, University, Mississippi.

[1]Bundy, E. R., "Obstacle Gain—Its Uses and Predictability," *CQ*, Nov., 1960, p. 72.

region, the field strength is due to both the direct plane wave and the cylindrical wave, so that we should expect interference between the two at various locations. Ground reflections are neglected in all of the examples.

### *Field Strength Behind The Hill*

Suppose we have a field strength meter and wish to determine how the signal changes as we increase the height of the receiving antenna from far below the hill to way above, holding the wavelength and the distance $b$ from the hill fixed. We might imagine that the measurements are made on a slowly moving elevator from the basement to the penthouse of a skyscraper located, say, 160 meters behind the hill ($b$=160).

The results of this experiment are shown in fig. 2 for the 80, 15, and 2 meter bands, where we have plotted depth $d$ below and height $h$ above the hill-top along the horizontal axis, and the ratio of measured field strength to the field strength of the plane wave (in the absence of the hill) on the vertical. For example, when the elevator is at a depth of 160 meters ($d$=160), the 80 meter signal is one tenth that of the incident plane wave. As we move up, the signal increases such that when we're even with the top of the hill ($d$=0 and angle $A$ is zero), the signal is one half that of the plane wave. We now pass into the illuminated region. The signal still increases and even goes beyond what it would be if the hill were absent until we reach a height $h$ of 98 meters above the top where the signal is a maximum. Apparently the plane wave from the transmitter and the cylindrical wave from the fictitious antenna are in phase and add to give a field strength 16% greater than the plane wave by itself. As we go higher the signal decreases, goes through a minimum, and oscillates as shown, until finally when we're way above the hill top, the field strength is just that of the plane wave alone; the influence of the hill is negligible at large heights. A similar result holds for all the other bands, so that only 80, 15, and 2 meters are illustrated. Thus diffraction may be considered simply as a redistribution of energy caused by an object in the presence of the incident wave.

Let's return to the shadow region and consider the following situation: We are still 160 meters behind the hill and ask at what depths will the relative field strength (or signal) be down to one tenth of the incident plane wave for the 2, 15, and 80 meter bands. According to fig. 2, the signal has already dropped to one-tenth on the 2 meter band at a depth of 24 meters whereas on 15 meters we can go down to a depth of 70 meters before the signal has dropped to a tenth, and if we are listening on the 80 meter band, we can go all the way to 160 meters below the top. From this we can draw a general conclusion which is perhaps the most important point of the article: For a fixed antenna location in the shadow region, the field strength will be greater the longer the wavelength becomes, which is to say that long wavelengths are bent or diffracted more than short wavelengths. It is as if the longer wavelengths are able to "wrap around" an obstacle better than short wavelengths. As a pseudo-clarinetist, the writer recommends that the musicians among our clan check this effect for sound waves by listening to a marching band and then stepping behind a building, being careful to avoid reflections, and observing whether the intensity of the upper instruments such as the flute and clarinet (corresponding to, say 2 meters) doesn't decrease relative to the lower instruments, such as the trombones (corresponding to 80 meters).

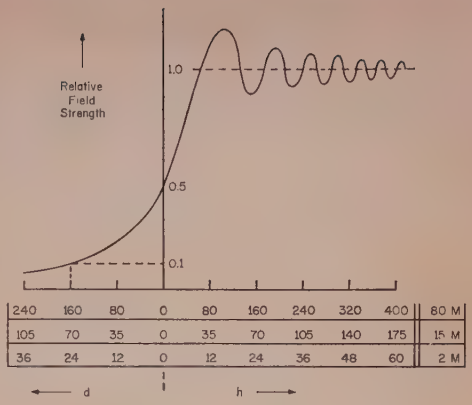



Fig. 2—Field strength at a depth $d$ below and a height $h$ above the hill-top relative to the incident plane wave is shown for the 80, 15, and 2 meter bands. The receiving antenna is 160 meters behind the hill ($b$=160). Depth $d$ and height $h$ are in meters.

It should be clear that in W5YE's original problem, it would have been best to use 80 m (or 160 if allowed) to hurdle the dam, assuming other conditions to be the same.

### *Polarization*

The previous results have been described without regard to polarization of the plane wave since we were interested in the overall effects due to diffraction alone, not exact values. The question now is, what effect would a horizontal transmitting antenna have on the field strength compared to a vertical antenna, for a fixed wavelength and receiver location?

Figure 3 shows the ratio of field strength for horizontal polarization (produced by a horizontal transmitting antenna) to vertical polarization plotted against the angle $A$ of fig. 1. It can be seen that, except in the forward direction (angle $A$=0), the vertical polarization always results in a better signal at a given location behind and below the hill. For example, when the receiving station is located such that angle $A$ is 20° (this might correspond to say, $b$ = 160 meters and a depth $d$ of 57 meters), the field strength for horizontal polarization is seven tenths of that for vertical polarization. As a general rule, we may say that a radio wave will be diffracted to a greater extent when it is

[*Continued on page 114*]

# Voice of America Amateur Radio Program

EVERY week the voice of America broadcasts the VOA Amateur radio programs to all areas of the world at various times throughout the day. The program consists of 15 minutes devoted to the latest gossip on the ham bands, interviews with radio amateurs around the world, propagation forecasts, and discussions of the latest technical news of interest to radio amateurs and shortwave listeners.

The broadcasts, in the English language, are written and voiced by Bill Leonard, W2SKE, one of America's leading news commentators, and a very active amateur. Gene Kern, W2BAK produces the program, and propagation forecasts are by Bill Dulin, W4ETT, and George Jacobs, W3ASK with radio amateurs *everywhere* invited to participate.

The distinctive QSL card of the VOA is available for exchange with listeners of the Ham Show, and W2SKE and the gang are looking forward to receiving QSL cards from radio amateurs and shortwave listeners everywhere. Listeners may forward their QSL cards to either of the following addresses: Bill Leonard, Post Office 29, Geneva 12, Switzerland or Amateur Radio, Box 922, Washington 4, D.C.

The world-wide Broadcast schedule for the VOA Amateur Radio Program is as follows:

### 0730-0745—Sunday

| Freq. in kc | Station | Beam |
|---|---|---|
| 0625 | WLWO | North Africa |
| 6080 | Tangier | Europe |
| 6180 | WDSI | Europe |

The Voice of the VOA Amateur Radio Program, Bill Leonard, W2SKE interviewing W1WY on a recent VOA program. The topic, now what do you think?

| | | |
|---|---|---|
| 9545 | Munich | So. Europe/Middle East |
| 9720 | Tangier | Europe |
| 9740 | WLWO | North Africa |
| 9770 | WLWO | West Africa |
| 11805 | WLWO | West Africa |
| 11875 | Tangier | Middle East |
| 15270 | Tangier | Europe |
| 15380 | Tangier | Middle East |
| 17780 | Munich | East Africa |

### 0745-0800—Sunday

| Freq. in kc | Station | Beam |
|---|---|---|
| 5985 | KNBH | Oceania |
| 6145 | KNBH | Far East |
| 9545 | KNBH | Far East |
| 9700 | NBH | Oceania |

### 0845-0900—Sunday

| Freq. in kc | Station | Beam |
|---|---|---|
| 6010 | Okinawa | East Asia |
| 6075 | Honolulu | East Asia |
| 7155 | Okinawa | East Asia |
| 7235 | Okinawa | East Asia |
| 9615 | Okinawa | East Asia |
| 9650 | Honolulu | Oceania |
| 11785 | Philippines | East Asia |
| 11895 | Philippines | East Asia |
| 15210 | Philippines | East Asia |
| 15250 | Philippines | East Asia |
| 15335 | Philippines | Southeast Asia |

### 2230-2245—Sunday

| Freq. in kc | Station | Beam |
|---|---|---|
| 1259 | Courier | Middle East |
| 3980 | Munich | Europe |
| 5975 | Munich | Europe |
| 6015 | Courier | Middle East |
| 6185 | Thessaloniki | Europe |
| 7130 | Courier | Middle East |
| 7205 | Thessaloniki | Middle East |
| 9530 | Munich | Middle East |
| 11770 | Munich | Central Africa |
| 15170 | Munich | West Africa |
| 15225 | Munich | West Africa |
| 17710 | WLWO | West Africa |
| 21610 | WLWO | West Africa |

### 0330-0345—Monday

| Freq. in kc | Station | Beam |
|---|---|---|
| 9650 | WLWO | Latin America |
| 9750 | WBOU | Latin America |
| 11955 | WBOU | Latin America |
| 15270 | WDSI | Latin America |
| 15325 | WBOU | Latin America |
| 15405 | WLWO | Latin America |

# THE VHF CONTEST

BY HOWARD FRUCHTER*, WA2DCM

1700: Flip on rig for long warm up. Adjust clock with WWV. Empty ashtrays. Sharpen 4 pencils.
1728: Work local. Tell him to look for me during contest.
1759: Tune across band with finger on send-receive switch.
1800: CQ Contest.
1801: First TVI complaint. Neighbor keeps me on phone for 15 minutes.
1818: CQ Contest.
1819: Local answers. Gives me his #014. I have him my #001.
1820: CQ Contest.
1821: Second TVI complaint. Neighbor asks me if I would QRT until 1900 so his daughter can watch "Happy Harry's Funhouse." Curse to myself, but agree.
1901: CQ Contest.
1902: WA2XXX, running 5 watts into a dipole gives me his #027. I give him my #002.
1903: CQ Contest.
1904: W2QSY gives me his #039, and reports I have drift on signal.
1905: Give W2QSY my #003, and tell him his receiver must not be warmed up because my v.f.o. is drift-free.
1906: W2QSY rogers my #003, but says drift is still present.
1907: No grid drive.
1923: Replace 5763 in my v.f.o.
1924: CQ Contest.
1925: K1 in New Hampshire calls me on 50.165 mc.
1926: Local running 500 watts calls "CQ Ragchew" on 50.166 mc.
1927: Inform K1 of QRM on his frequency. Ask him to QSY.
1928: Tune for K1; no answer.
1929: CQ Contest.
1930: OM turns on electric shaver.
1935: OM finishes shaving.
1936: CQ Contest.
1937: K2XYZ, out to, "give-the-boys-a-few points," gives me his #057. I give him my #004.
1938: Give up 6 meters. Flip rig up to 2. CQ Contest.
1939: WV2XQL gives me his #008. Also gives me his name, QTH, rig, age, best DX, etc. Asks for signal report, frequency check, time check, and QSL card.
1948: Roger everything, and answer all his questions. Promise to QSL. Give him my #005, and throw it back to him for complete exchange.
1952: He thanks me for promise of QSL card, but says his QTH is not yet in the *Call Book*. 865 dash 249th Street, B as in Bowling, A as in Antenna, R as in Receiver, N as in Nuvista, A as in America, R as in Roger, D as in Drift, New York—N as in Norway . . .
1955: Roger his QTH.
1956: CQ Contest.
1957: K3 answers, running S-3. Swing beam. Rotator jams pointing due South over the Atlantic Ocean. Decide to wait until morning to try to fix it.

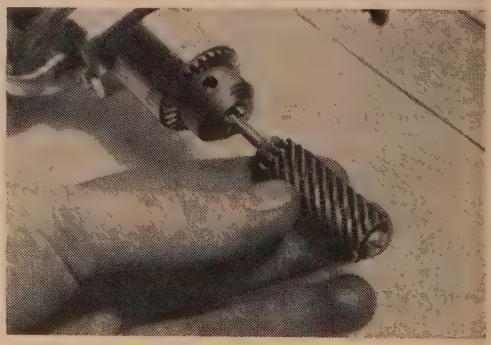
1959: CQ Contest.
2008: CQ Contest.
2025: CQ Contest.
2046: Work W2QSO/MM.
2047: CQ Contest.
2118: CQ Contest.
2135: CQ Contest.
2136: Decide rotator must be fixed. Tap rotator with hammer; four bolts fall off.
2157: Find and replace bolts. Return to shack. Swing beam north-west. CQ Contest.
2158: WV2XQQ gives me his #082. I give him my #007.
2159: Return to 6 meters. CQ Contest.
2200: TVI Complaint, #3.
2201: Return to 2 meters. CQ Contest.
2202: Net Control Station of Two Meter YL Chaser's and Beer Drinker's Net asks me to please QSY from net frequency until Midnight. Only have one crystal on 2

*589 Barnard Avenue, Woodmere, N. Y.

meters. Return to 6 meters. CQ Contest.
2203: TVI Complaint #4.
2205: Go QRT until 2400. Watch some TV. Have some coffee. Copy over Contest Log; 7 contacts. Empty ashtray, 12 cigarettes.
0001: CQ Contest.
0002: Hear last member of Two Meter YL Chaser's and Beer Drinker's Net ask other member how he likes high school before going QRT.
0004: WV2XYZ gives me his #108. I give him my #008.
0005: Return to 6 meters. CQ Contest.
0006: W1XID, Vermont, S-9 plus 30 db, peaking due *south* from New York, 50.184 mc, gives me his #317. I give him my #009, and thank him for Vermont QSO.
0008: CQ Contest.

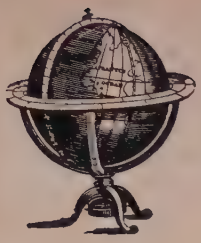
0009: Hear VE1QRX, S-9 plus 30 db, peaking due *south* from New York, on 50.184 mc calling CQ DX Asia.
0012: Hear 4S7XX/9G1, S-9 plus 30 db, peaking due *south* from New York, on 50.184 mc calling CQ Wrangel Island Phone-Patch.
0014: Call W1XID, VE1QRX or 4S7XX/9G1.
0015: WA2QLF, S-9 plus 30 db, peaking due *south* from New York on 50.184 mc goes QRT.
0016: Cross out contact #009, Vermont.
0020: CQ Contest.
0021: Band yields four Ragchewers, plus two stations around the 200 contact level working 1s, 3s, and 4s.
0058: K2XYZ (now on contact #221) still out to, "give-the-boys a-few-points," calls me.
0100: Return to K2XYZ and chew that rag for about an hour because band is dead.
0157: Sign with K2XYZ. CQ Contest.
0159: K2QQQ gives me his #114, and asked if I worked W1QRT, in Maine.
0200: Give him my #009, and ask where W1QRT was and when.
0201: He reports that K1QRT was on about 10 minutes ago, at 50.2 mc.
0203: Call K1QRT.
0208: Call K1QRT.
0214: Call K1QRT.
0217: CQ Contest. Band is dead.
0317: CQ Contest. Band is dead.
0417: CQ Contest. Band is dead.
0517: CQ Contest. Band is dead.
0617: CQ Contest.
0618: TVI Complaint. Neighbor's eight year old son asks me to turn off "the machine you have that's making funny pictures on my TV set so I can't watch Sunday Morning Funnies." Resist urge to hang up, and agree to QRT till 0800.
0620: Shut off rig. Have cup of coffee. Recopy Contest Log—9 QSO's. Open new pack of cigarettes.
0801: CQ Contest.
0802: Local, 2 miles away, running 75A-4, 417A converter, and 11-element beam gives me his #228, S-5.
0803: Give local my number #010, S-9 plus 60 db.
0804: Local rogers my #010, and says I'm now down to S-2.
0805: 6146 goes. No spare.
0900: Wake up W2QRN and borrow 6146.
0934: Replace 6146 in rig. CQ Contest.
0946: Band opens. 4s, 5s, 7s, 9s and Øs rolling in. W9QSO, S-9 plus 20 db calling me.
0947: TVI complaint. Agree to QRT till 1030.
1000: Listen to K7QRT, Nevada, calling CQ Contest. Bite fingernails, gulp tranquilizers.
1009: Can't resist temptation. Call K7QRT.
1010: TVI Complaint. Nasty language. I apologize. Go QRT.
1030: CQ DX Contest.
1031: Band Closes.
1032: Rip up log. Shut off rig. "Wait till next year!"

## Ham Hints



### Handy Hole Enlarger

A discarded office-type pencil sharpener blade makes an excellent hole enlarging shaper for a power drill. Fit a long machine screw through the cutter and turn a nut on tightly. This shaper makes quick work of chassis hole enlarging and lasts a long time too, because it is made of very high quality steel.



# DX DX DX DX DX

URBAN LE JEUNE, JR.*, W2DEC

The following certificates were issued between the period from September 5th, 1962 to and including October 5th.

## WAZ

### CW/PHONE WAZ

| | | |
|---|---|---|
| 1727 | PAØWOR | John Wortel |
| 1728 | CR7IZ | Rutilio Ferreira Graca |
| 1729 | VK5QR | Reg Galle |
| 1730 | K8ONV | Sally Mary Ryden |
| 1731 | K8OHG | Ken Ryden |
| 1732 | SP8HT | Raczek Tadeusz |
| 1733 | GI6TK | Frank A. Robb |
| 1734 | K6EIV | Alan C. Emerald |
| 1735 | VK2RA | R. A. Priddle |
| 1736 | G2WQ | Archie Brown |
| 1737 | W8KBT | T. Joe Shank, Jr. |
| 1738 | G3FPK | Norman A. S. Fitch |

### ALL-PHONE WAZ

| | | |
|---|---|---|
| 171 | LA5LG | Per Gunderson |
| 172 | KØCTL | Richard E. Melton |
| 173 | G3MVV | Norman Miller |
| 174 | HB9DS | Kurt Wydler |
| 175 | HB9KU | Dr. L. Valpiana |

### TWO-WAY SSB

| | | |
|---|---|---|
| 126 | G3KZI | J. A. Steele |
| 127 | WØMLY | Dick McKercher |
| 128 | GI3IVJ | Cedric J. Rourke |
| 129 | KØCTL | Richard E. Melton |
| 130 | OZ7FG | Frank Gotschalk |
| 131 | OE1ME | Dr. Anton Meller |

## CW WPX

| | | |
|---|---|---|
| 371 | SP7HX | Roman J. Izykowski |
| 372 | W4HVQ | Martin J. Mulqueen |
| 373 | W8JAQ | John W. Schwall |
| 374 | OH2FS | Arto Granlund |
| 375 | K9OKD | Wayne A. Strahl |
| 376 | G9LIO | Kermit Lehman |
| 377 | W3TXQ | William R. Hennigan |
| 378 | K6EIV | Alan C. Emerald |

## PHONE WPX

| | | |
|---|---|---|
| 76 | XE1CV | Carlos DeLeon, Jr. |
| 77 | IT1SMO | Athos Bellomo |
| 78 | CT1HF | Sergio Vieira de Melo |
| 79 | GI3CDF | Leslie M. Lyske |

## SSB WPX

| | | |
|---|---|---|
| 115 | W3AYD | Michael Solomon |
| 116 | K8PUU | Paul R. Nelson |
| 117 | GI3CDF | Leslie M. Lyske |
| 118 | WA2SFP | James L. Lawson |

## MIXED WPX

| | | |
|---|---|---|
| 44 | JA2JW | Yoh Hoshiyama |
| 45 | W3AYD | Michael Solomon |
| 46 | W3BVL | William T. Heller, Sr. |

*Box 35, Hazlet, New Jersey.

**HL Korea:** HL9KH will be active for two years starting approximately November 1st, 1962 and will be operated by Don Miller, W9WNV, who will be serving two years of active duty as a Captain in the U. S. Air Force, at the Osan Air Force Base, Osan, South Korea, where he will serve as an M.D. at the base hospital. Operations will be on c.w. and s.s.b., 10 through 160 meters, if allowed to operate 80 and 160. Don has shipped his own equipment, including an impressive variety of verticals and beams. He hopes to be especially active on the low bands and in DX contests as time permits. QSLing will be handled by L. B. Boles, W9VZP. W9VZP will also handle all requests for skeds. Don also hopes to DXpedite to some of the rarer spots in the area and is currently negotiating for such permission. *(Tnx WGDXC).*

**JT1 Mongolia:** A group of UA hams, possibly headed by UA3CR, will soon make a s.s.b. DXpedition to Mongolia.

**JZØ Indonesia:** The Dutch and Indonesians have come to a tentative agreement regarding JZØ. As it stands now, JZØ will be turned over to the UN shortly for about 6 months and then will revert to Indonesia who must hold a plebescite in 1969. The plebescite will determine whether the people want to be independent of Indonesia. In any case, the Dutch will not be involved. In view of the fact that the Dutch will no longer be involved, when JZØ passes into the UN administration, there will still be possibilities of ham operating. In this case, it *might* be accepted for PK6 (Celebes & Molucca). It won't be a new one because of the ZD2KHK/NC precedent *(Tnx NEDXA).*

OH5TK, OH2BZ and OH2BT recently spent 10 days signing /OHØ. During this period of time, they had 2000 QSOs, 300 of which were W's. The transmitter which was used ran 130 watts on c.w. and 100 watts on phone. *(Tnx K2UKQ)*

**KA Japan:** Vern, ex-KA2AB, is now stateside after an extended tour in Japan. He QSL'ed all stations worked and would like to send another if any went astray. See QTH section for Vern's present QTH.

**KG6 Mariana Islands:** In a note received by Joe, WA6TGY, from Skip, K2QGC/KG6, we learn that Skip is trying to obtain permission from the Pacific Trust Territory to make a DXpedition to Rota. So far, no luck. *(WA6TGY via WGDXC).*

**KS6 American Samoa:** The following letter from K5KOR/KS6 was received by his QSL manager, Mike, K5SEK:

"Well, I am back on the air in grand style. The new antenna is working great. Although the v.f.o. doesn't work, I made 200 QSO's in the last four days. The xmitting antenna is a ground-plane for 10-15 & 20 and is 50 feet high. The receiving antenna is a vertical ground plane 250 feet high, up the side of a mountain. I still have the GPR-90 and the Globe Scout. I hope to get the v.f.o. working soon. My frequency is 14.050. I am on daily from 0300 GMT to 1100 GMT on 20 c.w. and 20 a.m. Weekends on 21.075 c.w. at 0200 GMT to 0400 GMT, a.m. and c.w. On 20, the W8, W9, W7, W6 and W5 areas come in best at 0900 GMT to 0530 GMT. The W1, W2, W3 and W4 are best at 1200 GMT until 1500 GMT. On 15, W6 comes in good at 0200 GMT until 0900 GMT. I am on the air 40 hours a week now, and I expect to make 4000 to 6000 QSO's before I leave. I am having all W/K/VE QSL's sent to you and all foreign QSL's sent via the KS QSL Bureau. Chances look real good to get a Collins KWM-2 and 30L-I. If so, I will be on s.s.b."

**KX6 Marshall Islands:** The newly formed KX6 QSL Bureau (see QTH section) will endeavor to forward QSL for all ex-KX6's.

**PJ2M Saint Maarten:** Vince, PJ2ME, acquired a Drake 2B and a DX-100 on a recent trip to the states and has been very active of late. Jack, W2CTN, is still his QSL Manager. *(Tnx WGDXC).*

**SVØ Crete:** Tony, SVØWY, is now QRV from Crete on 14.323 s.s.b. at 1600 GMT. Tony thus joins SVØ's WT and WO as active Crete s.s.b. stations. *(Tnx NCDXC).*

**VK4W Willis Island:** VE7AM writes that he, with W9JJF, VK3WL, VE7ALE and VK5AB, plan a 15 day blitz to the Willis Islets next May. Each are tossing $500 in the pot but further financial help will be necessary as the trip will cost close to $6000. The license has already been obtained and the call will be VK4WE. VE7ZM and VK3WL will handle the c.w. and the others s.s.b. They also have tentative permission for Portuguese Timor and will operate there about a week after leaving VK4-land. *(Tnx* Yasme Newsletter).

Bill, W3BVL, as you will notice was awarded WPX this month. The final right behind Bill is an Eldico 1000F.

**VK9 Cocos Keeling Island:** In a letter received by Chuck, W9IHN, Lionel, VK9LA, advises that he will be on Cocos Keeling for another 15 months. He now has an HT-37 and has been active on 14312 s.s.b. between 1200 and 1500 GMT, mostly weekends. *(Tnx W9IHN via WGDXC).*

**VKØ Heard Island:** Steve, VKØVK, expects to be operational from Heard Island for approximately one month as of mid-January, 1963. Steve, a member of the Australian National Antarctic Research Expedition, will depart from Melbourne roughly January 1st, 1963 on an Australian leased Danish Polar vessel. The vessel will call at Heard Island where Steve will be a member of a shore party who will conduct a short program on the Island. While on the Island, Steve will be as active as is possible. Primary activity will be on 20 and 40 meters, c.w. and a.m. with a possibility of s.s.b. At the moment, the equipment on hand includes a National NC-109 receiver, a Heathkit DX-40 with a VF-1 v.f.o. and Hy-Gain Multi-band dipole. Steve has all the parts, *etc.* necessary to build an s.s.b. adapter for the DX-40. Lack of time, however, may well defer its being built until he is wintering over at Wilkes Base after the Heard stint. Primary c.w. frequencies will be multiples of 3503 kc, *i.e.* 7006, 14012, *etc.* with calls taken 3 kc up or down. Primary a.m. and s.s.b. (if used) activity will be on 14120 with calling instructions to be given. QSLs for the Heard operation only will be via K5ADQ. All QSOs will be QSLed. The Heard logs will return with the vessel to Australia where they will be mailed to the States. Upon receipt, QSLs will be made out for each QSO and mailed via the appropriate Bureaus. After the Heard stint, Steve will continue to Wilkes Base where he will winter over and where we can expect a repeat of his fine operation when he wintered over at Wilkes last year. QSLs for this phase of Steve's sojourn will be handled by his wife, Jeannie, and all Wilkes QSLs should be addressed via VK2VK. *(Tnx VKØVK via WGDXC).*

**VQ8A Agalega Island:** Harvey, VQ9HB, operated a few days from this newly added DXCC country using the call VQ9HB/MM. He has since been assigned the call of VQ8BFA and will operate from the Island periodically when the boat upon which he is a crew member calls at the Island.

**YVØ Aves Island:** The Radio Club Venezuelo is planning another DXpedition to Aves Island in January. *(Tnx WGDXC).*

**5B4 Cyprus:** Ted, G3LWS, is off to Cyprus for a tour of duty and will be active as 5B4CZ. He is taking a new KW Viceroy Tx and a KW-77 Rx. *(Tnx WGDXC).*

**Yasme:** Danny, after a stay in the Manihiki Group,

## WAZ and WPX

THE WAZ and WPX certificates are awarded by the *CQ* DX department. WAZ is issued for proof of contact with the 40 Zones of the world as shown on the official WAZ Zone Map. WAZ is issued in three classes, *i.e.* Any mode, all phone and all s.s.b. For complete rules, see the January, 1962 *CQ*, page 50.

WPX is issued in four classes, *i.e.*, all c.w., all phone, all s.s.b. and Mixed. The number of prefixes required are: C.W.-300; Phone-300; s.s.b.-200; Mixed-400. For complete rules, see January, 1962 *CQ*, page 52. WAZ applications, Zone Maps and WPX applications may be obtained from the DX Editor at the address shown at the head of this column. Please send a self-addressed, stamped envelope or a self-addressed envelope and an IRC. All applications should be sent directly to the DX Editor.

## WPX HONOR ROLL

### CW WPX

| | |
|---|---|
| W2HMJ | 668 |
| W5KC | 619 |
| W8KPL | 610 |
| W6KG | 574 |
| W2EQS | 572 |
| K6CQM | 565 |
| W5OLG | 564 |
| K9EAB | 551 |
| W2NUT | 550 |
| W9YSX | 544 |
| W9UXO | 542 |
| K2UKQ | 535 |
| W4OPM | 531 |
| W2HO | 526 |
| DL1QT | 518 |
| K9AGB | 515 |
| W1IJB | 513 |
| W1EQ | 512 |
| W6WO | 511 |
| W2GT | 510 |
| SM7MS | 510 |
| W8LY | 506 |
| W9DWQ | 506 |
| G3EYN | 503 |
| W9GFF | 503 |
| YU1AG | 503 |
| IT1AGA | 502 |
| W5LGG | 502 |
| W6YY | 502 |
| K2CPR | 501 |
| W9SFR | 501 |
| K2ZKU | 500 |
| W2MUM | 495 |
| W1WLW | 494 |
| G2GM | 494 |
| SM5CCE | 488 |
| W4BYU | 487 |
| ON4QX | 486 |
| W8PQQ | 481 |
| W4HYW | 478 |
| W3OCU | 466 |
| K6SXA | 464 |
| W2KIR | 463 |
| JA2JW | 461 |
| W9WCE | 458 |
| W3BCY | 457 |
| PAØLOU | 451 |
| W3PGB | 450 |
| DL1YA | 450 |
| W8JIN | 449 |
| W8RQ | 445 |
| W3AYD | 443 |
| OE1FF | 442 |
| LA5HE | 437 |
| W3BQA | 437 |
| W8UMR | 429 |
| WØAUB | 429 |
| K5LIA | 428 |
| OK1MB | 428 |
| W3CGS | 426 |
| W1EIO | 425 |
| SM5WI | 425 |
| WØPGI | 420 |
| HB9TT | 419 |
| OK3EA | 419 |
| W8IBX | 416 |
| WØMCX | 416 |
| W5AWT | 412 |
| W5DA | 412 |
| WA2DIG | 411 |
| K5LZO | 411 |
| W2PTD | 411 |
| W4DKP | 410 |
| W1CKU | 408 |
| K4JVE | 407 |
| W5AFX | 407 |
| W4YWX | 404 |

### PHONE WPX

| | |
|---|---|
| CT1PK | 587 |
| G3DO | 565 |
| W9WHM | 562 |
| W8WT | 561 |
| W9YSQ | 471 |
| MP4BBW | 454 |
| PAØHBO | 453 |
| W6YY | 448 |
| G8KS | 430 |
| VK6RU | 421 |
| W3AYD | 420 |
| F8PI | 418 |
| W9UZC | 418 |
| PZ1AX | 413 |
| K2CJN | 409 |
| DL3TJ | 404 |
| W1UOP | 402 |
| G3NUG | 400 |
| OE1FF | 382 |
| TG9AD | 381 |
| SP7HX | 381 |
| DL6VM | 376 |
| PAØSNG | 369 |
| K9EAB | 366 |
| G3FKM | 366 |
| W8UMR | 363 |
| SM3EP | 361 |
| W5ERY | 358 |
| W8JIN | 356 |
| W9UZC | 356 |
| DL3TJ | 354 |
| PY2CK | 354 |

### SSB WPX

| | |
|---|---|
| W4OPM | 400 |
| MP4BBW | 392 |
| TI2HP | 356 |
| W3MAC | 354 |
| K9EAB | 350 |
| PZ1AX | 345 |
| G8KS | 341 |
| W2HXG | 324 |
| W2VCZ | 320 |
| W8PQQ | 315 |
| HB9TL | 315 |
| G3DO | 311 |
| K4PUS | 305 |
| K1IXG | 303 |
| KØRDP | 300 |
| W6YMV | 293 |
| K2MGE | 273 |
| W1UOP | 273 |
| WØCVU | 271 |
| K2TDI | 264 |
| DJ3CP | 260 |

### MIXED WPX

| | |
|---|---|
| W8JIN | 605 |
| G3DO | 597 |
| W4OPM | 595 |
| W3OCU | 588 |
| W8WT | 583 |
| W6YY | 570 |
| W4BYU | 557 |
| K9EAB | 553 |
| W3AYD | 552 |
| HB9EU | 551 |
| YU1AG | 533 |
| W2GT | 528 |
| G8KS | 520 |
| W5LGG | 509 |
| W9DWQ | 508 |
| K2ZKU | 508 |
| W3KDP | 501 |
| W8UMR | 500 |

will be off to the new Republic of Samoa, after that, probably Niue, ZK2, and Tonga, VR5. *(Tnx* Yasme Newsletter).

### Gus

By the time you read this, Gus should have finished his ZD9 and Bouvet operation. His itinerary from this point, depending on licensing, should be more or less as follows: Return to the African mainland and with ZS6IF to operate from ZS7/8/9. Then, off to VQ1 for a few days and on to Madagascar. Then, with as yet an unnamed 5R8 to as many FB8 islands as possible. Afterwards off to FR7 and VQ8 where VQ8AI will join Gus in operation from several VQ8 islands. From this point, Gus will leave for Calcutta, India where he hopes to get travel permission to operate from AC3-AC5 and 9N1. However, as this is being written, it looks rather doubtful that he will receive such traveling permission. In any event, he will then leave for East Pakistan AP5, and to CR8, Portuguese Timor. Operation is then planned from Cocos and Christmas Island. The VK9 Christmas Island, not the VR3 one. The trip will be finished with the operation from several of the VK Islands including Willis, to New Zealand, ZM6, Hawaii, W6, W5 and then back to W4BPD when the most ambitious DXpedition of all time will have been completed.

### 160 Meters

The following letter, which was received from HI8XAG by W2EQS, should be of interest to you 160 meter men.

"Thank you very much for the nice letter, the QSL and, of course, the wonderful QSOs. I still have not been able to locate a 160 meter rig anywhere in the City. Since neither of my transmitters cover 160, I will have to build another rig. In running through my junk box, I find that I will need to have a crystal and a final coil to complete the rig. When it is finished, it will run slightly over 50 watts on c.w.

"I am going to write to the Manager of Telecommunications here in the Dominicin Republic (he is a personal friend) and try to get special permission to operate an experimental station at low power with the express purpose of contacting amateurs in other countries to further international relations. If I don't get that, I will try to get permission to install a low power experimental station and conduct on-the-air tests with no intention to communicate with other stations. In any event, the Dominican Republic will be on 160 meters this winter operating c.w. on to you. The receiver here is a National HRO and I will be using a 275 foot 'hunk of wire' about 30 feet in the air. I will be listening on 160 and if anything comes through, I will send the info to you."

Bert, H18XAG

Charlie also passes along the following 160 meter comments: "We expect a banner season for 160 DX. Perhaps HH, CO and YN will be on. I'm trying to convince them. Definitely to be on will be HC, HI, HH, XE, KH6, VK, ZL, SU, EL and plenty of other European and some other North, Central or South American countries. It is also rumored that OX will be permitted the use of the band this year and there is a distinct possibility that the OH hams may once again be given operating permission. There is another African country that will be on but due to 160 meter operating problems, I have been requested not to give his call or country."

Activity has recently been initiated in the Hawaiian Islands. At the present, holding forth nightly on 1995 kc (a.m. and s.s.b.) and c.w. at 0500 GMT are the following stations: W6WBY/KH6, WØFCL/KH6, KH6DVD, KH6EMC and W7UXP/KH6. Average power input of the above stations is in the order of 180 watts and the antenna vary from random length long wires to W6WBY/KH6's 600 foot-on-a-leg Vee beam.

Signal exchanges have been made with West Coast stations with excellent signal strength being reported both directions. Confirmation of reception is solicited from any one hearing any of the above-mentioned stations. We will also appreciate s.w.l. reports. *(Tnx W6WBY/KH6).*

Stew, W1BB, furnishes the following 160 meter news: "The Annual special "Tests" will be held this season on the following Sunday mornings from 0500 to 0730 GMT: Dec. 2 and 16, Jan. 6 and 20, Feb. 3 and 17. During these periods, extra special efforts will be made to contact European, Asian, African and other 160 meter DX stations throughout the world.

"W/VE stations, *etc.*, should call CQ DX Test the

Dave, ZD8RN, caused quite a furor during his brief stay on Ascension Island. This is the rig which was in use while there. *(Tnx W9IRN).*

first five minute period of the hour, then the third and fifth *etc.* Listen for DX who will call the second, fourth, sixth, *etc.*, five minute periods, around the clock during the tests. Thus stations alternately call for five minutes and listen five minutes. However, DX contacts are made whenever possible, regardless of the periods.

"Results should be reported via air mail to Stew Perry, W1BB, 36 Pleasant Street, Winthrop, Massachusetts."

First Transatlantic Crossing of 1962 was made Sept. 16 by Dick, W3GQF/359 and Jack, G6QB/449 at 0524 GMT, one of the earliest openings on record. Second crossing was made by W1BB/489 at 0405 GMT and G6BQ/579 Sept. 29th. Third by K3MBF Sept. 29.

The VKs with their new liberties on 160 have broken through for solid QSOs. Solid contact for a definite first was made by Walt, W1EFN, on Sept. 20 when he QSO'd VK3ADR after daylight at 1030 GMT. The following Friday K3MBF, W2FYT, W1EFN worked VK3HG. Saturday, Sept. 22, VK3ADR broke through solid from 1000-1100 GMT peaking 579 and QSO'd W1BB/1 and W3GQF. The next week, Sept. 27 W2FYT, W3SO, W2EQS QSO'd VK3AKR.

VP8GQ is coming through again and has QSO'd W3SO, W8HGW, VE3DU, VE3GP and others. It looks as though an excellent season is in the making so get your long wires ready.

## American States Association

West Gulf DX Club member, Frank, W5IGJ, has organized the American States Association, ASA. The association is composed of 100 members, two from each of the 50 states. These members are all top DXCC operators and all are anxious to assist foreign DX stations in obtaining their WAS. For those foreign DX stations interested in completing their WAS, further information on the ASA can be obtained by forwarding a request to Frank, W5IGJ.

This is a wonderful idea, and I wish you the best of luck with it, Frank.

## The "VQ Areas" Awards

The Radio Society of East Africa issues 3 certificates which are available to radio amateurs throughout the World on submission of adequate confirmations and in conformity with the following rules:

I. Worked all VQ Areas Award—This is acknowledged to be a difficult certificate to obtain and is in all senses of the word a 'real DX certificate'. It is correspondingly large in dimensions and well worth trying for. This is a rare award possessed by only very few amateurs.

To qualify, licensed amateurs must submit QSL cards or a list certified by their National Radio Amateur Society as follows: 1 QSL card from VQ1, 10 QSL cards from VQ2, 5 QSL cards from VQ3 or 5H3, 20 QSL cards from VQ4, 5 QSL cards from VQ5, 1 QSL card from VQ6 or 6O2, 1 QSL card from VQ7 (Aldabra or Amiranti Is), 1 QSL card from VQ8 (Chagos), 1 QSL card from VQ8 (Mauritius), 1 QSL card from VQ9 (Seychelles, Aldabra or Amiranti). One QSL card from VQ9 will be accepted in lieu of VQ7 or vice versa.

Five *extra* QSL cards from any VQ area may be substituted for any missing card. Certificates are issued for c.w., phone, c.w. & phone or s.s.b.

II. The Radio Society of East Africa Award — A smaller certificate, attractively lithographed with typical East African motif, issued to meet the need for a simpler award covering DX contacts with East Africa and the Indian Ocean.

To qualify, 25 points must be scored, (as follows) and cards must be submitted from at least four of the VQ call areas.

VQ1 5 points, VQ2 1 point, VQ3 (or 5H3) 3 points, VQ4 1 point, VQ5 3 points, VQ6 (or 6O2) 4 points, VQ7 5 points, VQ8 Mauritius 4 points, VQ8 Chagos 4 points, VQ8 Rodriguez 5 points, VQ9 5 points.

Certificates are issued for c.w., phone, c.w. & phone or s.s.b.

QSL cards or certified list as for WAVQ Award must be submitted together with remittance and claim.

*Charges:* Each Certificate costs Shs. 7/-Sterling or U. S. $1 or 15 International Reply Coupons which *must* accompany *all* claims. This charge covers return postage by surface (sea) mail.

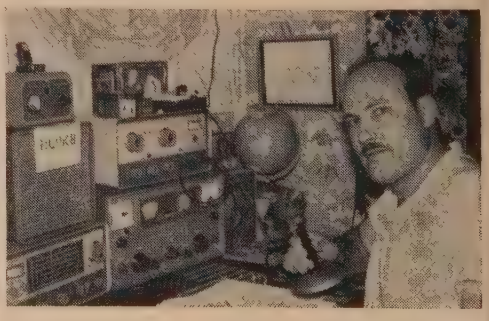
*Address:* Claims should be sent to: The Awards Manager, Radio Society of East Africa, P. O. Box 5681, Nairobi, Kenya, East Africa.

## QTH's and QSL Managers

Ed, VE4OX, regrets to inform the gang that EL6E has not sent logs as promised so Ed will not be able to help with cards.

**ex-CR5AR** now CT1LL.
**CR6CA** via K4ICA.
**CR6EI** Box 74, Benguela, Angola.
**ET3LM** P.O. Box 1014, AID, c/o U.S. Embassy, APO 319, N.Y., N.Y.
**FA2VX** Bill Porter, c/o State Dept. Mail Room, Washington, D.C.
**FG7XG** Louis, Box 521, Pointe-a-Pitre.
**FS7GS** via K9KDI.
**G3PAG** J. J. Davies, 139 The Fairway, Leigh-on-Sea, Essex, England.
**HI8XAG** Bert, M.A.A.G., U.S. Embassy, Santo Domingo, Dom. Rep.
**HL9KB** Albert Martin, Sig. Sect. EUSA, APO 301, San Francisco, Cal.
**HL9KH** via W9VZP.
**ex KA2AB** Vernon Smith, 335 Baker St., Biloxi, Miss.
**W6WBY/KH6** 6181 Ibis Avenue, Ewa Beach, Oahu, Hawaii.
**W7UXP/KH6** 6181 Ibis Avenue, Ewa Beach, Oahu, Hawaii.
**KR6** QSL Bureau, Okinawa Amateur Radio Club, APO 331 c/o PM, San Francisco, Cal. or P.O. Box 37, Kadena, Okinawa.
**KX6** QSL Bureau (New) Kwajelein Amateur Radio Club KX6BU. Box 444, Navy 824 FPO San Francisco, Calif.
**ex-JZØML** 5 Whitehall Rd., London W7, England.
**OAØHA** Las Palmas AFB, Lima, Peru.
**OAØHV** Ralph, USAF Mission, c/o U.S. Embassy, Lima, Peru.
**OY7ML** Martin Haasen, Bogota 4, Torshavn, Faroe Islands.
**PJ5MB** via K9KDI.
**SVØWT** via KØRDP.
**W5HCZ/VO2** via VO2UA.
**VP2AF** Martin, Market St., St. George.
**VP2SY** via K2MRB.
**VQ1GDW** via ISWL.
**VQ2WM** via W2CTN.
**VQ4IV** Box 2428, Naurobi, Kenya.
**VQ5IV** Box 355, Kampala, Uganda.
**VQ9HB** Capt. Harvey Brain, Bel Eau, Mahe, Seychelles.
**VR3L/VR1** via WA6MAZ.
**VR3O** via WA6MAZ.
**VR3S** (Martin only) via WA6MAZ.
**VS1GC** Neville G. Cooper, 69 Siglap Rd., Singapore 15.
**VS9AE** (ex EP2BD) I. Dunbar, Telecomms. B.P. (Aden) Ltd. Steamer Point, Aden.
**ZP5CN** via K4RSM.
**4S7BR** P.O. Box 355, Colombo, Ceylon.
**4S7PG** Box 907, Colombo, Ceylon.
**5B4TC** S. Crabtree, HQ Forces Broadcasting Stn. BFPO 53, Cyprus.
**5H3BJ** via W7PHO.
**5N2JKO** via W9FVK.
**6O1WF** Box 6, American Embassy, Mogadiscio, Somali Rep.
**6O1WT** U. S. Embassy, Mogadiscia Somali Rep.
**9G1EE** Box 233, Tema, Ghana.
**9K2AG** P.O. Box 433, Kuwait, Persian Gulf.
**9U5AS** via ON4HK.
**9U5BH** via W4ECI (W4-BPD operation only).
**9U5DM** P.O. Box 1, Usumbara, Burundi.
**9U5ZZ** via W4ECI.

73, Urb, W2DEC



Al, HL9KB, shown at his operating position in Seoul. Al has already worked about 50 countries and 35 states using 25 watts and a ground plane.

# PROPAGATION

GEORGE JACOBS*, W3ASK

### LAST MINUTE FORECAST

The following is a forecast of day-to-day propagation conditions expected during December, 1962. This forecast attempts to predict *specific* days upon which openings shown in the Propagation Charts in this column are most likely to occur, and the expected quality of the openings. For example, the following forecast shows that circuits rated (2) in the Propagation Charts are most likely to open with "fair" to "good" quality (B-C) when conditions are above normal (Dec. 6, 8) and with "fair-to-poor" quality (C-D) when conditions are expected to be normal. Circuits rated (2) are not expected to open on those days forecast to be "disturbed," etc.

### PREDICTED PROPAGATION CONDITIONS & CIRCUIT QUALITY

| *Prop. Chart Forecast Rating* | *Above Normal Days (WWV rating 7 or higher)* Dec. 6, 8, 10, 14 | *Normal Days (WWV rating 5-6)* Dec. 4, 5, 7, 9, 11-13, 15-18, 23, 27, 31 | *Below Normal Days (WWV rating 4)* Dec. 1-3, 19, 22, 24-26, 28, 30 | *Disturbed Days (WWV rating 3 or less)* Dec. 20-21, 29 |
|---|---|---|---|---|
| (1) | C | D-E | E | E |
| (2) | B-C | C-D | D | E |
| (3) | A-B | B-C | C-D | D-E |
| (4) | A | A-B | C | D |

Where:

A—An excellent opening, with strong steady signals.

B—A good opening, moderately strong signals, with little fading and noise.

C—A fair opening, signals fluctuating between moderately strong and weak, with moderate fading and noise.

D—A poor opening, signals generally weak, with considerable fading and high noise level.

E—A very poor opening, or none at all.

SOME 10 meter DX openings are expected, generally to southern areas of the world, during the daylight hours. Openings, however, will be considerably less numerous than during previous years of higher solar activity. Fifteen meters is expected to open to most areas of the world during December and January. Openings may vary from day-to-day, with signal levels exceptionally strong on some days and weak and fading on other days. Twenty meters is likely to be the optimum band for DX during the daylight hours. Fairly good openings are predicted to most areas of the world, and the band is expected to be somewhat more stable than 15 meters.

A considerable improvement is expected in propagation conditions on 40, 80 and 160 meters. The 40 meter band should open for DX during the early afternoon hours, and remain open to one area of the world or another during the hours of darkness and the early daylight hours. Frequent 80 meter DX openings, often with exceptionally strong signal levels, are forecast to many areas of the world during the hours of darkness. DX conditions on 160 meters are expected to be better this winter than at any time during the past seven years. DX openings to many areas of the world are predicted during the hours of darkness.

### VHF Ionospheric Openings

There is a tendency for sporadic-*E* propagation to reach a minor seasonal peak during December and early January (the major peak occurs during the early summer months). This should result in a number of short-skip openings, between approximately 800 and 1400 miles, on 10 and 6 meters.

A major meteor shower, the *Geminids*, is scheduled to take place during the second week of December. It is possible that short-skip v.h.f. openings up to distances of approximately 1000 miles may take place as a result of ionization produced by the meteors as they enter the earth's atmosphere.

V.h.f. ionospheric openings over several hundred miles are also likely to occur during periods of auroral displays or ionospheric storminess. Check the "Last Minute Forecast" appearing at the beginning of this column for those days that are expected to be "disturbed" or "below normal".

### Annual 160 Meter DX Tests

This season's annual 160 meter test periods will be held on Sunday mornings, December 2 and 16, January 6 and 20 and February 3 and 17 from Midnight to 2:30 A.M. EST (0500-0730 GMT). During these test periods, special efforts will be made to contact European, Asian, African and other 160 meter DXers throughout the world. The 160 meter test periods have been held every year since 1932 (except during World War II), and the results have contributed much to the knowledge of propagation conditions on the Top Band. The test periods *are not* DX contests, and there is no competition or scores. The main purpose of the tests are to generate 160 meter activity in order to study propagation conditions in as many areas of the world as possible.

During the test periods W/VE stations call "CQ DX TEST" the *first* five minutes of each hour, and each alternate five minutes thereafter, *listening* the *second* five minute period, and each alternate five minute period after that. DX stations will, of course, use the opposite periods for transmitting and receiving. Once contact is made, the QSO can continue without regard to the calling and listening periods. Most W/VE stations east of the Mississippi River

*11303 Clara St., Silver Spring, Md.

will operate in the 1800-1825 kc segment of the 160 meter band, while those west of the river will use 1976-2000 kc, clustering near 2000 kc. Most DX stations will usually be found between 1795-1850 kc, while some will be found near 2000 kc (ZLs).

With the continued decrease in solar activity, a further improvement in nighttime DX propagation conditions is expected on the 160 meter band this winter. It should be possible to work more DX on this band, and signals levels are expected to be considerably stronger, than during past test periods. There are many firsts yet to be made on 160 meters, and many unusual propagation conditions to investigate. More complete detatils concerning this season's test period can be obtained from Stewart S. Perry, W1BB, 36 Pleasant Street, Winthrop, Mass.

### Sunspot Cycle

The Zurich Solar Observatory reports a monthly sunspot number of 52 for September, 1962. This results in a monthly smoothed sunspot number, upon which the sunspot cycle effect is based, of 39 centered on March, 1962. A smoothed sunspot number of 30 is predicted for December, 1962.

When the smoothed sunspot number drops below 40, the solar cycle is generally considered to be in its "low phase". The present cycle entered its low phase during March, 1962 and is expected to remain in this phase for at least the next four years.

### Amateur Sporadic-*E* Propagation Research

In the June, 1962 issue of *CQ* (page 37), Morgan (K7ALE) and Dorothy (K7ALF) Monroe presented the results of a three-year radio amateur sporatdic-*E* propagation research project in their report entitled "50 mc. Propagation Effects; Mid-Point Report On A Six-Year DX Study".

The report, based on 6 meter observations made almost continuously during 1959-1961, identified daily, seasonal and sunspot trends in DX propagation on this band. The report shed new light on the propagation of v.h.f. signals over considerable distances by means of ionospheric reflection. The Monroes now report that sporadic-*E* propagation conditions on 6 meters during the 1962 summer period were excellent, despite an unusual lag during August. They rate the season as the best observed during the four year study period, although the statistics appear to indicate that it was down slightly from 1961.

The following chart summarizes the results of the 1962 summer observations, as compared to the results of the previous three summers.

**Comparative 50 mc Summer Sporadic-*E***

*May 16-August 15*

| | 1959 | 1960 | 1961 | 1962 |
|---|---|---|---|---|
| 1. No. monitored days | 91 | 91 | 91 | 91 |
| 2. No. days band opened | 51 | 62 | 66 | 63 |
| 3. No. of band openings | 63 | 89 | 94 | 93 |
| 4. Total minutes band open | 10,157 | 9,556 | 18,785 | 16,870 |
| 5. Average duration of opening (minutes) | 161.2 | 107.4 | 199.8 | 181.4 |
| 6. % open to monitored time | 12.4 | 11.7 | 22.9 | 20.6 |
| 7. % open to total time | 7.8 | 7.3 | 14.3 | 12.9 |
| 8. % open to monitored days | 56.0 | 68.1 | 72.5 | 69.2 |
| 9. No. states heard/worked | 36 | 28 | 46 | 43 |
| 10. No. foreign prefixes heard/worked | 3 | 2 | 6 | 7 |
| 11. Average smoothed sunspot number | 158 | 110 | 54 | 35 |

### The Sunspot Story

Looking for a last minute Christmas gift for your radio amateur or s.w.l. friends? Why not buy a few copies of "The Sunspot Story, Cycle 19; The Declining Years"? This 28-page booklet contains the entire Jacobs-Leinwoll report which appeared originally as a 3-part article in the April, May and June, 1961 issues of *CQ*. The report, of increased importance since the present sunspot cycle has entered its

[*Text continued on page 101*]

## December 1962 & January 1963

Time Zone: EST (24-Hour Time)

EASTERN USA To:

| | *10/5 Meters* | *20 Meters* | *40 Meters* | *80/160 Meters* |
|---|---|---|---|---|
| Western & Central Europe | 08-12 (1)*<br>07-08 (1)<br>08-09 (3)<br>09-11 (4)<br>11-12 (3)<br>12-13 (2)<br>13-15 (1) | 06-07 (1)<br>07-08 (2)<br>08-10 (3)<br>10-12 (4)<br>12-13 (3)<br>13-14 (2)<br>14-17 (1) | 15-17 (1)<br>17-18 (2)<br>18-23 (4)<br>23-00 (3)<br>00-03 (2)<br>03-05 (1) | 18-20 (1)<br>20-23 (2)<br>23-03 (3)<br>03-04 (1)<br>20-00 (1)†<br>00-02 (2)†<br>02-03 (1)† |
| Eastern Europe & Eastern USSR | 08-11 (1)*<br>07-08 (1)<br>08-10 (2)<br>10-13 (1) | 06-07 (1)<br>07-10 (2)<br>10-16 (1) | 17-03 (1) | 19-02 (1)<br>21-01 (1)† |
| North Africa & Southern Europe | 07-09 (1)*<br>09-11 (2)*<br>11-13 (1)*<br>06-07 (1)<br>07-08 (2)<br>08-10 (4)<br>10-11 (3)<br>11-12 (2)<br>12-15 (1) | 06-07 (1)<br>07-09 (2)<br>09-11 (1)<br>11-13 (3)<br>13-14 (2)<br>14-17 (1) | 15-17 (1)<br>17-18 (2)<br>18-19 (3)<br>19-22 (4)<br>22-01 (3)<br>01-02 (2)<br>02-05 (1) | 17-19 (1)<br>19-20 (2)<br>20-23 (3)<br>23-00 (2)<br>00-01 (1)<br>19-01 (1)† |
| South Africa | 08-10 (1)*<br>10-12 (2)*<br>12-15 (1)*<br>06-10 (1)<br>10-12 (2)<br>12-14 (3)<br>14-15 (2)<br>15-17 (1) | 07-14 (1)<br>14-15 (2)<br>15-17 (3)<br>17-18 (2)<br>18-21 (1) | 18-19 (1)<br>19-21 (2)<br>21-00 (1) | 19-22 (1)<br>19-22 (1)† |
| Eastern Mediterranean | 08-11 (1)*<br>07-08 (1)<br>08-10 (2)<br>10-13 (1) | 07-08 (1)<br>08-11 (2)<br>11-17 (1) | 19-00 (1) | 20-23 (1) |
| Central Asia | 07-10 (1)<br>18-20 (1) | 07-09 (1)<br>18-21 (1) | 06-08 (1)<br>19-22 (1) | *NIL* |
| Southeast Asia | 08-11 (1)<br>18-20 (1) | 06-07 (1)<br>07-09 (2)<br>09-12 (1)<br>18-21 (1) | 06-08 (1)<br>17-20 (1) | *NIL* |
| Far East | 17-21 (1) | 06-09 (1)<br>18-21 (1) | 05-08 (1) | *NIL* |
| Pacific Islands & New Zealand | 13-18 (1)*<br>07-12 (1)<br>12-17 (2)<br>17-19 (1) | 03-07 (1)<br>07-10 (2)<br>10-13 (1)<br>18-21 (1) | 01-02 (1)<br>02-04 (2)<br>04-07 (3)<br>07-08 (2)<br>08-09 (1) | 04-05 (1)<br>05-07 (2)<br>07-08 (1)<br>04-07 (1)† |
| Australia | 16-19 (1)*<br>09-12 (1)<br>15-17 (1)<br>17-19 (2)<br>19-21 (1) | 06-07 (1)<br>07-09 (3)<br>09-11 (2)<br>11-15 (1)<br>19-22 (1) | 04-06 (1)<br>06-08 (2)<br>08-09 (1) | 05-08 (1)<br>05-07 (1)† |
| South America | 07-12 (1)*<br>12-16 (2)*<br>16-18 (1)*<br>06-07 (1)<br>07-14 (2)<br>14-16 (4)<br>16-17 (3)<br>17-18 (2)<br>18-20 (1) | 06-09 (2)<br>09-14 (1)<br>14-15 (2)<br>15-17 (3)<br>17-19 (4)<br>19-21 (3)<br>21-01 (2)<br>01-06 (1) | 18-20 (1)<br>20-22 (2)<br>22-00 (3)<br>00-04 (2)<br>04-07 (1) | 19-21 (1)<br>21-02 (2)<br>02-05 (1)<br>21-04 (1)† |
| McMurdo Sound Antarctica | 07-08 (1)<br>08-10 (2)<br>10-12 (1)<br>17-19 (1) | 06-07 (1)<br>07-08 (2)<br>08-12 (1)<br>17-19 (1)<br>19-22 (2)<br>22-04 (1) | 23-07 (1) | *NIL* |

* Predicted 10 meter openings, all others 15 meters.
† Predicted 160 meter openings, all others 80 meters.

## Time Zones: CST & MST (24-Hour Time)
### Central USA To:

| | *10/15 Meters* | *20 Meters* | *40 Meters* | *80/160 Meters* |
|---|---|---|---|---|
| Western & Central Europe | 09-11 (1)*<br>07-09 (1)<br>09-11 (3)<br>11-14 (1) | 07-08 (1)<br>08-10 (2)<br>10-12 (3)<br>12-14 (2)<br>14-16 (1) | 15-17 (1)<br>17-23 (2)<br>23-03 (1) | 17-19 (1)<br>19-21 (2)<br>21-02 (1)<br>20-01 (1)† |
| Eastern Europe & European USSR | 07-12 (1) | 07-08 (1)<br>08-10 (2)<br>10-13 (1) | 18-01 (1) | 20-00 (1)<br>21-23 (1)† |
| North Africa & Southern Europe | 08-12 (1)*<br>07-08 (1)<br>08-09 (2)<br>09-11 (3)<br>11-12 (2)<br>12-14 (1) | 07-08 (1)<br>08-10 (2)<br>10-12 (3)<br>12-13 (2)<br>13-17 (1) | 15-17 (1)<br>17-18 (2)<br>18-23 (3)<br>23-01 (2)<br>01-03 (1) | 17-19 (1)<br>19-22 (2)<br>22-01 (1)<br>18-00 (1)† |
| Central Africa | 08-10 (1)*<br>10-13 (2)*<br>13-16 (1)*<br>07-10 (1)<br>10-12 (2)<br>12-14 (4)<br>14-16 (2)<br>16-18 (1) | 08-12 (1)<br>12-14 (2)<br>14-17 (3)<br>17-19 (2)<br>19-22 (1) | 18-20 (1)<br>20-22 (2)<br>22-00 (1) | 19-22 (1)<br>19-22 (1)† |
| Eastern Mediterranean | 07-11 (1) | 07-09 (1)<br>09-11 (2)<br>11-15 (1) | 18-23 (1) | 20-22 (1) |
| Central Asia | 07-10 (1)<br>19-21 (1) | 07-09 (1)<br>19-21 (1) | 06-08 (1)<br>19-21 (1) | *NIL* |
| Southeast Asia | 09-12 (1)<br>17-20 (1) | 07-09 (2)<br>09-12 (1)<br>17-20 (1) | 06-08 (1)<br>17-19 (1) | *NIL* |
| Far East | 16-17 (1)<br>17-19 (2)<br>19-20 (1) | 06-07 (1)<br>07-09 (2)<br>09-11 (1)<br>15-17 (1)<br>17-19 (2)<br>19-21 (1) | 03-09 (1) | 04-07 (1) |
| Pacific Islands & New Zealand | 11-13 (1)*<br>13-17 (2)*<br>17-19 (1)*<br>09-11 (1)<br>11-14 (2)<br>14-17 (3)<br>17-19 (2)<br>19-21 (1) | 17-19 (1)<br>19-22 (2)<br>22-07 (1)<br>07-09 (2)<br>09-12 (1) | 23-01 (1)<br>01-06 (3)<br>06-07 (2)<br>07-09 (1) | 00-01 (1)<br>01-06 (2)<br>06-08 (1)<br>03-07 (1)† |
| Australia | 14-19 (1)*<br>08-13 (1)<br>13-15 (2)<br>15-17 (3)<br>17-19 (2)<br>19-21 (1) | 06-08 (1)<br>08-10 (2)<br>10-15 (1)<br>19-22 (1) | 01-03 (1)<br>03-07 (3)<br>07-08 (2)<br>08-09 (1) | 03-05 (1)<br>05-07 (2)<br>07-08 (1)<br>04-07 (1)† |
| South America | 07-11 (1)*<br>11-15 (2)*<br>15-17 (1)*<br>06-07 (1)<br>07-12 (2)<br>12-16 (4)<br>16-18 (2)<br>18-20 (1) | 06-08 (2)<br>08-13 (1)<br>13-15 (2)<br>15-18 (4)<br>18-01 (2)<br>01-06 (1) | 18-20 (1)<br>20-22 (2)<br>22-02 (3)<br>02-04 (2)<br>04-06 (1) | 20-23 (1)<br>23-02 (2)<br>02-04 (1)<br>23-03 (1)† |
| McMurdo Sound, Antarctica | 06-07 (1)<br>07-09 (2)<br>09-12 (1)<br>16-19 (1) | 06 07 (1)<br>07-09 (2)<br>09-11 (1)<br>17-19 (1)<br>19-21 (2)<br>21-04 (1) | 00-06 (1) | *NIL* |

## Time Zone: PST (24-Hour Time)
### Western USA To:

| | *10/15 Meters* | *20 Meters* | *40 Meters* | *80/160 Meters* |
|---|---|---|---|---|
| Western & Central Europe | 07-09 (1)*<br>06-07 (1)<br>07-09 (2)<br>09-11 (1) | 05-07 (1)<br>07-10 (2)<br>10-13 (1) | 16-00 (1) | 18-23 (1)<br>19-22 (1)† |
| Eastern Europe & European USSR | 07-09 (1) | 06-08 (1)<br>08-10 (2)<br>10-13 (1) | 17-00 (1) | 19-23 (1) |
| Southern Europe & North Africa | 07-09 (1)*<br>06-07 (1)<br>07-09 (2)<br>09-11 (1) | 05-07 (1)<br>07-10 (2)<br>10-14 (1) | 16-18 (1)<br>18-22 (2)<br>22-00 (1) | 18-22 (1)<br>18-20 (1)† |
| Eastern Mediterranean | 07-09 (1) | 07-10 (1) | 18-22 (1) | *NIL* |
| South Africa | 08-13 (1)*<br>06-08 (1)<br>08-10 (2)<br>10-12 (3)<br>12-14 (2)<br>14-16 (1) | 09-11 (1)<br>11-13 (2)<br>13-15 (3)<br>15-17 (2)<br>17-19 (1) | 18-21 (1) | 18-20 (1) |
| Central Asia | 08-10 (1)<br>17-19 (1) | 07-10 (1)<br>17-20 (1) | 05-07 (1) | *NIL* |
| Southeast Asia | 15-18 (1)*<br>09-11 (1)<br>15-16 (1)<br>16-18 (2)<br>18-19 (1) | 08-09 (1)<br>09-11 (2)<br>11-12 (1)<br>15-20 (1) | 01-04 (1)<br>04-07 (2)<br>07-09 (1) | 04-07 (1) |
| Far East | 14-17 (1)*<br>13-15 (1)<br>15-17 (2)<br>17-19 (1) | 08-10 (1)<br>13-14 (1)<br>14-17 (3)<br>17-19 (2)<br>19-20 (1) | 22-00 (1)<br>00-06 (3)<br>06-08 (2)<br>08-10 (1) | 00-01 (1)<br>01-05 (2)<br>05-08 (1)<br>01-06 (1)† |
| Pacific Islands | 10-17 (1)*<br>09-12 (3)<br>12-14 (2)<br>14-16 (3)<br>16-18 (2)<br>18-20 (1) | 07-08 (1)<br>08-10 (2)<br>10-17 (1)<br>17-19 (2)<br>19-21 (1) | 20-22 (1)<br>22-00 (2)<br>00-05 (3)<br>05-07 (2)<br>07-09 (1) | 00-03 (1)<br>03-06 (2)<br>06-08 (1)<br>03-06 (1)† |
| Australia & New Zealand | 11-13 (1)*<br>13-15 (2)*<br>15-17 (1)*<br>08-10 (1)<br>10-12 (2)<br>12-16 (1)<br>16-18 (2)<br>18-19 (1) | 07-08 (1)<br>08-10 (2)<br>10-12 (1)<br>16-18 (1)<br>18-20 (2)<br>20-22 (1) | 01-03 (1)<br>03-05 (2)<br>05-07 (3)<br>07-09 (1) | 03-05 (1)<br>05-06 (2)<br>06-08 (1)<br>04-07 (1)† |
| South America | 07-09 (1)*<br>09-14 (2)*<br>14-16 (1)*<br>06-07 (1)<br>07-12 (2)<br>12-14 (4)<br>14-16 (2)<br>16-18 (1) | 14-16 (2)<br>16-18 (4)<br>18-22 (2)<br>22-05 (1)<br>05-07 (2)<br>07-14 (1) | 18-20 (1)<br>20-22 (2)<br>22-00 (3)<br>00-02 (2)<br>02-04 (1) | 20-22 (1)<br>22-01 (2)<br>01-03 (1)<br>22-01 (1)† |
| McMurdo Sound, Antarctica | 06-07 (1)<br>07-09 (2)<br>09-12 (1)<br>16-19 (1) | 16-18 (1)<br>18-22 (2)<br>22-03 (1)<br>06-07 (1)<br>07-09 (2)<br>09-12 (1) | 00-05 (1) | *NIL* |

*Explanation Of Forecast Ratings*

The numerical rating appearing in parenthesis following each predicted time of band opening indicates the *total* number of days during each month of the forecast period that the opening is expected to occur, as follows:

(1) Less than 7 days
(2) Between 8 and 13 days
(3) Between 14 and 22 days
(4) More than 22 days

For the *specific* days of each month on which a particular opening is most likely to occur, as well as a day-to-day forecast of reception conditions (signal quality, noise and fading levels), see the "Last Minute Forecast" which appears at the beginnin of this column.

The *CQ* DX propagation Charts are based upon a double-sideband AM effective radiated power of 600 watts, a single-sideband ERP of 300 watts, and a CW ERP of 150 watts, at antenna radiation angles less than thirty degrees. The Eastern USA Chart can be used in the 1, 2, 3, 4 and 8 amateur call areas; the Central USA Chart in the 5, 9 and Ø areas, and the Western USA Chart in the 6 and 7 areas. The Charts are valid through January 31, 1963. Propagation information contained in these Charts is derived from basic ionospheric data published by the Central Radio Propagation Laboratory of the National Bureau of Standards, Boulder, Colorado.

# CONTEST CALENDAR

FRANK ANZALONE*, W1WY

## CALENDAR of EVENTS

| | | |
|---|---|---|
| December | 1- 2 | RSGB 21/28 Phone |
| December | 9th | OK DX C.W. |
| January | 26-27 | *CQ* WW 160 |
| January | 26-28 | New Mexico Party |
| February | 9-11 | ARRL DX Phone |
| February | 16-17 | B E R U |
| February | 16-17 | QCWA Party |
| February | 23-25 | ARRL DX C.W. |
| March | 2- 3 | YL/OM Phone |
| March | 9-11 | ARRL DX Phone |
| March | 16-17 | YL/OM C.W. |
| March | 23-25 | ARRL DX C.W. |
| March | 23rd | APDX (Pakistan) |
| March | 30-31 | *CQ* WW SSB |
| March | 30-31 | REF C.W. |

### RSGB 21/28

Starts: 0700 GMT Saturday, December 1st
Ends: 1900 GMT Sunday, December 2nd

This is a phone only contest on the two high frequency bands. Pickings might turn out to be rather slim, but give it a try, there might be some surprise openings.

Last month's CALENDAR had complete rules. However we recommend you carefully read rules #2, #3 and #4 which cover the scoring. Especially #4, the rule regarding an additional 50 bonus points for each 10 stations worked in each country/numeral prefix. (Not each additional 10 British Isle stations.)

Mailing dateline is December 17th. Your logs go to the R.S.G.B. Contest Committee, New Ruskin House, Little Russell Street, London, W.C.1, England.

### OK DX

Starts: 0000 GMT Sunday, December 9th.
Ends: 2400 GMT Sunday, December 9th.

This is a world wide c.w. contest so don't concentrate on working OK stations only. However contacts with Czeck stations is worth double value or 6 points.

Your multiplier is derived from the number of different continents worked on each band, not countries.

And this year the contest is extended over a 24 hour period, a welcome improvement. For scoring purposes however you are still limited to 12 continuous hours out of the 24 hour contest period.

Awards will be made for single band and all band operation, as well as single operator and multi-operator classification. In the all band division you are limited to 3 bands for scoring. Better check the rules as outlined in last month's CALENDAR.

Deadline for mailing is January 15th 1963 and your logs go to the Central Radio Club, P. O. Box 69, Prague 1, Czechoslovakia.

### CQ WW 160

Starts: 0200 GMT Saturday, January 26th.
Ends: 1400 GMT Sunday, January 27th.

The results were so gratifying in last year's contest that no rule changes will be made for this the fourth annual *CQ* 160 Contest.

However the dates have been moved up a month, to the last week-end in January. This will avoid a conflict with other activities in February. The ARRL as well as the RSGB Top Band contest. And January is usually considered a better month for 160 activity.

1. This is a c.w. contest *only*.

2. For W/VE/VO contacts with other W/VE/VO stations, 2 points per QSO.

For W/VE/VO contacts to any other countries, 10 points per QSO.

3. For all other countries, 2 points per QSO with stations in the same country; 5 points per QSO with stations in other countries. Except for contacts with W/VE/VO, which will count 10 points.

4. For all stations: A multiplier of 1 for each State, Canadian province or foreign country worked.

5. Final Score: Total points multiplied by the total multiplier.

6. Serial number: RST report plus a progressive number starting with 001 for the first contact.

7. Sample logging: W1BB 589001 Mass.

Hawaii will be considered a "foreign country" for QSO and multiplier credit. And the district of Columbia will count same as Maryland.

Certificates to the Top stations in each State, Canadian Province and foreign country.

Your logs should be postmarked no later than February 18th and they go to: *CQ*, Att: 160 Contest, 300 West 43rd Street, New York 36, N. Y.

### New Mexico Party

Starts: 1500 GMT Saturday, January 26th.
Ends: 0300 GMT Monday, January 28th.

The fourth New Mexico Party will be sponsored by the CHC Chapter #1 of New Mexico. Last year's party was declared a big success. With the CHCers in back of this one and promised activity from some of the rare counties, this one should be an even bigger success.

[*Continued on page 101*]

*14 Sherwood Road, Stamford, Conn.

# HAM CLINIC

CHARLES J. SCHAUERS*, W4VZO

ALTHOUGH a large number of hams utilize the v.h.f. and u.h.f. bands, the majority use the h.f. bands (3-30 mc) for the greater part of their operating. However, with the declining sunspot cycle, the h.f. bands are deteriorating, and with the passing of time, DX will be sporadic and few contacts over long hops will be made on 10, 15 and 20 meters until around the year 1966.

As we know, the ionosphere, which is composed of more than one ionized layer, reflects radio signals whose frequencies fall within the h.f. band. Multi-reflection or multi-hop effects from the ionosphere also occur, but these are not dependable for reliable communication for long periods. Short-term variations of the reflectivity of the ionosphere occur during the day and night; long-term variations occur during sunspot cycle changes, and variations also occur on a monthly and seasonal basis.

We have much to learn about the ionosphere, but much progress is being made because of the use of new techniques in vertical and oblique sounding which we will briefly discuss here. Depending upon the frequencies involved, the ionosphere acts like a "sponge" or a parabolic reflector. Reflection of radio signals also depends on the degree of ionization (said to be caused by ultraviolet sunlight) of the ionosphere's layers. These ionospheric layers occur at various heights above the earth. Starting with the *D* layer, the ionosphere is composed of the *E*, *F*1 and *F*2 layers.

The *D* layer has a maximum height of about 55 miles; the *E* layer about 70 miles; *F*1 layer from about 110 to 155 miles and the *F*2 layer from about 150 miles to 250 miles.

Existing only during the daylight hours, the *D* layer ionization density corresponds roughly with the altitude of the sun above the horizon.

For h.f. propagation during the daylight hours at distances of 1000 miles or less, the *E* layer does the reflecting. Its ionization density also corresponds with sun altitude. Also, it acts as the propagation factor for medium frequencies at night for distances of 150 miles or more.

Heavy patches of intensely ionized rarefied air at *E* layer height occur frequently. Propagation due to this effect is called sporadic-*E* and makes it possible to use the very high frequencies (v.h.f.) for a long distance one-hop communication. Sporadic-*E* also has a tendency to attenuate certain frequencies which are normally reflected by higher layers.

The *F*1 layer reflects high frequencies and exists only during daylight hours. Waves which manage to penetrate the *E* layer usually push through the *F*1 layer also and these are generally reflected by the *F*2 layer.

For DX communication using h.f., the *F*2 layer is the main reflecting medium. Its height and ionization vary with the sunspot cycle, diurnally and seasonally. At a height of around 200 miles (at night), the *F*1 layer merges with the *F*2 layer, and because there is less *E* layer absorption, noise and field intensities will increase.

Other than by listening to a band and looking for stations in specific geographical areas, hams have no instantaneous way of knowing when a particular band is open to a particular spot. The band opening predictions (which appear every month in *CQ* in the PROPAGATION COLUMN conducted by my good friend George Jacobs) can be utilized as a rule-of-thumb.

## Questions

**DX-40 Modification Info**—The following information will answer most of the questions asked about the DX-40 modification which appeared in the June, 1962 issue of this column:

1) The modification was designed for 3rd overtone crystal operation; not v.f.o. input.

2) Yes, do use a grid-dip meter to check on the coil resonance of $L_1$ and $L_2$. Your particular placement can influence the operation of the coils, requiring a turn or two less, especially if mounted close to the chassis bottom and/or sides.

3) Another small relay (resembling the Advance #1504) which will work fine is the Potter and Brumfield type RY-195 ($3.50) from Lafayette Radio.

4) Yes, you can use the 10 meter switch positions for the modification and pare the 10 meter coil for 6 meter operation. Use 1/3 less coil.

5) $RFC_1$ and $RFC_2$ are the Z-50 high frequency chokes in series with existing chokes in the plate of the 6CL6 and the 6146.

6) If your crystal does not oscillate, try moving the tap on $L_1$ (upper diagram, page 33, June, 1962 *CQ*).

7) If you lack drive to the final, try a 20K 1 watt resistor in the screen of the 6U8 instead of the 27K resistor shown.

8) When you encounter final instability, try a parasitic choke of 3½ turns in the plate of the 6146. The choke should be wound with #26 enamel wire on a ½ watt low value resistor (100 ohms).

One desperate character sent his DX-40 to HAM CLINIC to determine what he did wrong. Had he carefully checked the text and followed the diagrams, he would have saved transportation money and time. He knows now that you cannot use a 7 mc crystal, nor will the set operate without screen voltage on the pentode half of the 6U8. In the future please do not send any equipment to me to check out; time is simply not available for this sort of thing. Drop a card, and we'll do what we can.

TECHNICAL ANSWERING SERVICE

W4VZO is now /HB9, residing in Luzern, Switzerland, and although his mail is sent in batches by first class mail, there will be a delay of about one month on most correspondence. Amateurs visiting Europe are invited to contact him when in the area. Telephone LUZERN 20144.

*c/o *CQ*, 300 W. 43 St., N. Y. 36, N. Y.

**HE-29B Modification**—"I tried your modification of the HE-29 walkie-talkies from Lafayette for 10 meters and I have gotten good results. I plan to purchase a couple of HE-29B (the HE-29 with an r.f. stage added to the superhet receiver). Now how about increasing power input? Can it be done? If so, how?"

Even if you increased the r.f. input from 100 to 200 milliwatts in this rig, you would not have enough audio to modulate it fully. Increasing the battery voltage from 12 to 14 will give you a little more r.f. and a little more modulating power, but not too much. In order to increase the gain (output) by 3 db, you would have to double the power. This rig (whose conversion was described in the December 1961 *CQ* column) will drive a nuvistor tube to full 1 watt output in Class B. However, I have not yet gotten around to trying it.

**TX-1 Improvement**—"I hear via the bands that the TX-1 v.f.o. can be improved by using another tube. Any info?"

Yes. Try a 6AH6 instead of the 6AU6. Because of the increased current required by the 6AH6 it is wise if a transformer having the correct current and voltage output be used. The 6AH6 requires 6.3 volts at 450 mils, whereas the 6AU6 requires only 300 mils.

**B19 Mark II Radio Set Conversion**—"Where can I get info for converting the B19 Mark II radio set?"

See the November 1951 issue of *Radio-Electronics*. The article shows one how to put this set on 75 and 2 meters.

**BC-929A Oscilloscope Conversion**—"In what issue of *CQ* did conversion information appear on the surplus BC-929A oscilloscope?"

It didn't. It appeared in the August 1957 issue of *QST*.

**Converter I.F.'s**—"I note that some receiver manufacturers are making receivers now with extra band calibrations for the v.h.f. bands. Tell me, if I get one of these sets how do I build the converter which will 'fit' the calibration scale?"

All you need to know is the i.f. used by the manufacturer for converter input. A crystal controlled converter having proper i.f. output for the receiver in question will operate so that the bands used can be calibrated directly. Only necessary dial mechanical adjustment (like in the NC-303) need be done.

**Johnson Viking Messenger Transceiver to 10 Meters**—"Well, after using CB for over a year and a half, I decided to become a ham. I got my General license and am as happy as can be! Now I would like to convert my Johnson Viking Messenger transceiver for 10 meter use. Can you help me?"

Good for you and welcome aboard! If you will write to the Johnson Company and ask for their instructions for converting the Johnson Viking Messenger to 10 meters they will send them to you. The conversion is easy to make and requires only a few parts and hamband crystals. Good luck!

Incidentally, I would like to suggest to manufacturers of CB equipment for use in the 27 mc band that they begin to think about conversions to 10 meters for the CB'ers who will become hams. With more power on 10 meters, it is possible to make ground-wave contacts far exceeding the little 5 watt efforts of the CB'ers. As a local (25 to 50 miles) band, the 10 meter spectrum is ideal, for there are a lot of frequencies and little QRM because of the low point in the sunspot cycle we are now in. Then too, the band occasionally opens up for world-wide contacts which *cannot* be enjoyed by CB'ers!

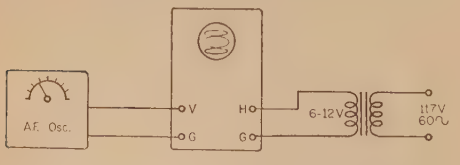



Fig. 1—System for calibrating an a.f. oscillator using a scope and employing Lissajous figures.

**A.F. Oscillator Calibration**—"I recently constructed an a.f. oscillator but I do not know how to calibrate it. Can you tell me how?"

Yes. See fig. 1. The output of the audio oscillator is fed into the vertical plates of an oscilloscope (via internal amplifiers). The horizontal input of the scope is fed from the line through an isolation transformer or variac. You can use a filament transformer, 6-12 volts. Lissajous figures (see page 543 of the 1962 *ARRL Radio Handbook*) can be used to calibrate your oscillator (using 60 cycle line input) up to around 500 cycles. For higher frequencies you can use another a.f. oscillator of known calibration and feed 1,000 cycles into the horizontal input.

**High Level Speech Clipper**—"I'm an a.m. man and work a lot of mobile. What I'd like is a high level speech clipper which will boost my average output. Nothing fancy, just something that works. Okay?"

See fig. 2. This is a high level clipper. Presuming that you're using a 6146 final and running the tube at around 600 volts at 100 ma, your plate load would be around 6000 ohms. In this case, use .5 henry for *L* and .006 mf for $C_2$ and $C_3$. For $C_1$ use about .005 mf. The coil *L* should be capable of handling 600 volts at 100 ma. Be safe and increase this by 25%. The selenium rectifier can be any type that handles a p.i.v. over 600 volts and around 200 ma or so. This gadget *works!*

Make certain that the capacitors used will handle the working voltage.

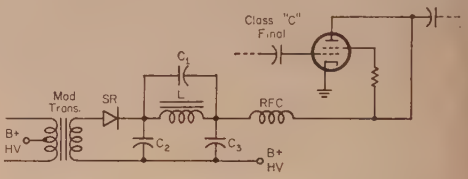



Fig. 2—High level speech clipper. See text for values.

**Tape Recorder Keyer**—"I would like to use my tape recorder to key my transmitter, and as yet have not come up with a workable idea. What I want to do is to record code on tape and then use it to key my transmitter. I realize that a relay is necessary but how do I connect it up?"

See fig. 3. The capacitor value will vary according to the "hold time" desired or keying speed. This scheme can be used as a voice-operated relay too. Use a 10 mf capacitor in this case.

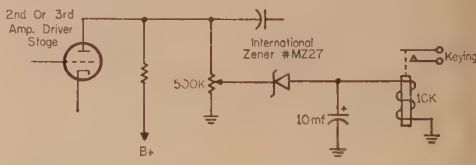



Fig. 3—One method for using tape recorded signals to drive a keying relay.

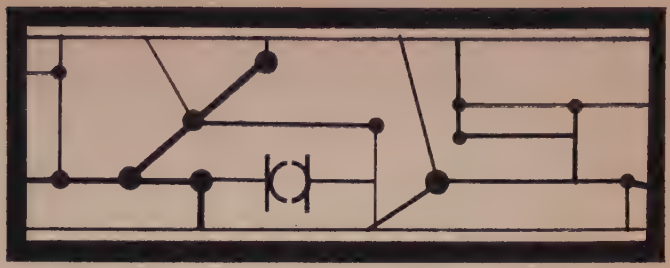
## Thirty

HAM CLINIC extends its heartiest seasons greetings to all of its readers. We appreciate the warm encouragement tendered to us during 1962 and hope that the year 1963 will be no less active. Do write to us with your technical problems and we shall do our best to assist you. If we cannot, you can bet that we've tried.

Have you entered our contest for the DX-40 and the $25.00? Better hurry before it is too late. Perhaps you have the idea that you will be a winner and contribute to our effort for better international understanding and goodwill.

73 and 75 and 72, Chuck

# NOVICE



WALTER G. BURDINE*, W8ZCV

As you should know, this column is written for both the Novice and the Technician class licensee. It can be used for the dissemination of any information that will aid either or both classes, or simply amateur radio in general. Your letters, including ideas for improving our ranks, make up the bulk of this section. We have seldom, if ever, hesitated to print ideas from readers which would prove helpful to newcomers. If you have any pet projects in the works, we'd like to hear about them. These contributions on your part help to make this column, as well as *CQ* itself, bigger and better.

One idea which might prove interesting to many would be to find out how many of the younger generation (under 18) Novices, Technicians, and Generals have received their WAS, WAC, WBE, DXCC, USA-CA, CHC or other major amateur awards. I'd like to have letters and pictures from you or any of your friends who have managed to join the above mentioned ranks. We sincerely feel that any young amateur who has been awarded these certificates would make an interesting feature story in a future column. May we hear from you?

### First Novice Wins USA-CA Award

Curtis E. Maiden, WN4EBE, 142 Park Street, Abingdon, Virginia, has been awarded USA-CA 500 all c.w. (#123) certificate for work on the Novice portion of 80, 40 and 15 meters. He is the first Novice to be so awarded, and is certainly in line for our congratulations. Curtis is located in the Washington County area of Virginia and has provided many other aspirants with that section towards their award.

Read Clif Evans' column in *CQ* and make up your mind that you can be on your way to be Novice #2 for the USA-CA. I'm working for mine now, and I must say that it's been fun. I am learning more geography looking up those county names than I ever learned in all my school years.

### Youngest Novice WAS Winner

In the September issue I asked who was the youngest Novice to get the ARRL Worked All States (WAS) award. A letter arrived recently from Jim Janke, K9WIE, of Waupaca, Wisconsin, telling me that when he was 11 year old KN9WIE he received his WAS award. Jim now is 14 and has 93 countries toward DXCC and already has a Worked All Continents (WAC) award on his wall. His rig is a Ranger, SX-100 and a TA-3 beam. He lost the "N" in April, 1961. Our congratulations to you, Jim. Be looking for you on the air. I almost have my ham shack operational once again, and will shortly be on the lower frequencies, if I can endure the QRM. Keep us informed!

*R.F.D. 3, Waynesville, Ohio.

### Net News

The Minnesota Novice Net (MNN) operates on 3725 kc at 1930 Minnesota time. The net exists to handle traffic and to improve number's code speed and operating ability. Contact Nick Alex, KØJFJ, Rochester, Minnesota for further information about this net.

The Missouri Slow Speed Net (MSSN) operates on 3715 kc Monday through Friday at 2000 GMT and on Saturdays at 1400 GMT. For further information contact Frank Helton, WNØCWV, Rural Route 1, Holden, Missouri. Frank says that Novices desiring to join the net should listen to the net for a few days to get the hang of things and that they should have a list of the QN signals available for ready reference.

A net for Tennessee Novices meets every Saturday at 1:00 PM CST. The net frequency was not given, but information can be obtained from David Ballew, WN4HZQ, Nashville, Tennessee. The net is called "SIGS" and only Novices from Tennessee are eligible.

If you participate in a net that is operated for the benefit of the Novice or Technician and you would like to let others know about its operation, just send along the information to me. Don't forget that it will take several months after you send the letter to make these pages. For example, this column is being written in early October and some of the mail was received 40 days ago. Plan ahead.

I am planning a tour through the offices of the Continental QSL Club in Dayton, Ohio, and will give you all the dope soon. They are planning something exciting for the new hams that keep coming along and for the old timers as well. I am interested in their operations, as we have long needed some way to deliver QSLs to the new licensees. The Continental folks have made provisions for getting calls, names and addresses of new licensees every week, and they do all of the addressing and mailing of your QSLs. Sounds good to me!

Tommy Thomas, WV6WPG, Buena Park, California says the part of the Novice Column he likes best is the letters section, but he would like to work some DX. He should work it with this HT-40K, SX-140 and Mosely-vertical combination. He has worked as far as Ohio and Hawaii all on 40.

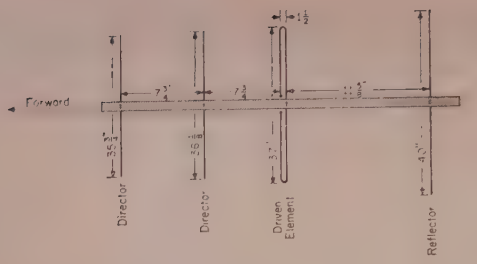



Fig. 1—Two meter four element close quarters antenna. All elements except the driven element are ⅜" tubing. The driven element is constructed of ¼" o.d. copper tubing. Boom length is only 2' 3⅛".

## Two Meter "Close Quarters" Antenna

I must warn you that no compromise antenna will work as well as a good beam, well constructed and erected. But, of course, not everybody has the space, time, or finances to erect such an antenna. So, the next best thing to do is to put up a compromise antenna and get the most out of it that is possible. To this end I have been collecting information about close quarters antennas for those readers that are in need of such information. The fact that the antenna is of a make-shift nature doesn't mean that it will operate if it is just thrown together without the usual precautions in construction. Don't forget to solder all connections and make them as solid mechanically and electronically as possible; use tape to waterproof the connections. I like to use acrylic spray to insulate and waterproof all soldered joints before taping with a waterproof tape. Make all mechanical contacts as strong as is feasible and at the same time keeping it as light as you can. Erect, brace, and guy this temporary antenna as though it were going to be used for years; it just might, you know.

The two meter four element beam shown here is really an antenna for close quarters, needing only 4 feet of space for its rotation. I have one of these mounted on the back of my car for mobile operation. It really helps in stretching those contact distances. I was recently able to maintain contact with Glen, K8SOC, of Franklin, Ohio and Bob, K8VMA, also of Franklin, while mobile almost to Dillsboro, Indiana. I was operating K9BOU/mobile while en route to my farm near Madison, Indiana; this is a distance of about 50 miles—not bad for a Gonset II and a four element beam only 6 feet off the ground . . .

The mobile antenna is mounted on the rear bumper, 20 inches in from the driver's side of the car. I have not as yet made it rotatable from the driver's seat, but have plans for that soon. I have it matched so that I can take the Gonset from the house and plug the antenna into the mobile installation without any adjustment and immediately go on the air; this took a good deal of work but it saves having to load the antenna when you are in a hurry.

Construction is very simple and can best be shown in drawings and then worked out with your own materials at hand. I used a redwood boom and old surplus TV antenna elements, with a length of copper gasoline line for the dipole and matching section. Use a coaxial cable with stranded center for mobile used to help prevent inner conductor breakage. The matching transformer is made from a 19 inch length of ⅜" o.d. copper tubing, available at the local automotive supply store. A piece of the RG-8C/U is stripped of its outer covering and shielding for a distance of about 2 feet and the inner conductor is passed through the copper pipe with the shield soldered to the bottom end of the pipe. The other end of the coax inner conductor is fastened to the ends of the dipole antenna, while the other end of the dipole is fastened to a piece of flexible wire previously soldered to the upper end of the copper pipe. The end of the transformer should be sealed with sealing wax or some such material to keep out the water and weather conditions so that the impedance won't change with each change of the weather; this is important for the proper operation of the antenna. Care should be taken not to melt the insulation from the inner conductor of the coax when soldering the antenna connections. I have a BNC connector fastened to the bottom of my transformer so that I can have a quick way of disconnecting the antenna.

The boom of the mobile antenna is constructed of ¾ inch aluminum tubing with the elements mounted through the boom and welded; the copper tubing is clamped to the boom. The biggest job is bending the dipole after putting the copper tubing through the hole in the boom. With care and patience it can be done. I have made most of these antennas with a redwood boom painted with aluminum paint; they really look nice and last for years. I start with a piece of redwood 30 inches long and 1½ inch square and taper the bottom to about ½ inch at each end. This gives the boom a neat streamlined appearance. There are a large number of these in operation around here and a copy of this antenna was used to contact our MARS net last summer when we flew a C-47 over the area while K8NBY was operating in Coldwater, Michigan. Mac was mobile and running a Gonset I transmitter. This antenna if constructed carefully will give a good account of itself.

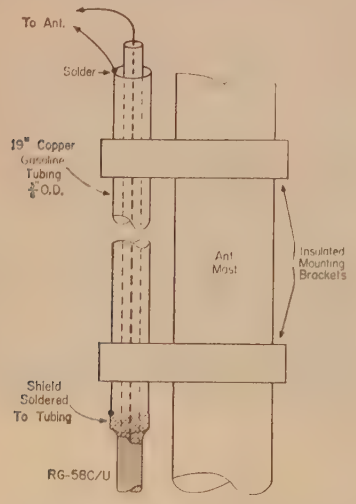



Fig. 2—Construction of the feeding section, showing mounting brackets in place.

## Letters

"Dear Walt: Many, many thanks for taking the time and effort to write such an interesting and in-

[*Continued on page 108*]

Dwight (Pepper) Cochran, K9ZLA of Highland, Indiana is the youngest ORS in the State. He is working DX with this neat outfit but says the QSLs cost more than the operation of the rig, he is 14, had his General when he was 13, and can copy 40 w.p.m.

# RTTY

BYRON H. KRETZMAN*, W2JTP

TEST equipment for radioteletype is not necessarily different from the test equipment you would *(or should!)* find in an ordinary ham shack. (The October 1961 RTTY COLUMN discussed this subject in detail.) There are, of course, some pieces of test equipment designed especially for RTTY. For example, it is very desirable to be able to check your whole station, from a.f.s.k. oscillator to the converter output, for telegraph bias; or in other words, to make sure your *mark* is equal in length to your *space*.

At first thought you might think that you could use an oscilloscope to look at the pulses that key the receiving selector magnets of a machine. Well, you *can*, but not by keying your system with a repeated Teletype character from the keyboard or from an automatic transmitter-distributor. It's those extra-long "stop" pulses that knock the 'scope out of sync. For the record, there are available commercially highly sophisticated bias measuring test sets that work from Teletype characters, but they are priced far out of reach of most amateurs.

### Telegraph Bias Checks

The simple solution to this problem is to key your system with square waves. You could use an audio oscillator, such as the Heathkit IG-82, set at about 23 cycles, to key a polar relay which in turn would be used to key your a.f.s.k. or f.s.k. oscillator. The 'scope then connects to the local loop that keys the machine. The 'scope easily syncs to the test signal and it is immediately obvious whether or not the *mark* and *space* are equal. (It is assumed that the polar relay is properly adjusted.)

Some time ago Phil Catona, W2JAV, realized that not everyone has the audio oscillator, nor does everyone have a *correctly* adjusted polar relay. So Phil designed a very simple transistorized square wave generator that can be used to directly key an a.f.s.k. oscillator via the usual diodes connected as a "dry" keyer. Such an a.f.s.k. oscillator was described in your RTTY COLUMN in the March 1962 issue of *CQ*. Figure 1 is the schematic diagram of the W2JAV Dot Generator. No external power is required; power is supplied by a pair of penlight-size flashlight batteries. Two inexpensive 2N404 transistors, $Q_1$ and $Q_2$, are connected in a "flop-flop" or multivibrator circuit. Its output is fed to a keyer stage, $Q_3$, another 2N404 transistor, which is used to key the diodes in the associated a.f.s.k. oscillator. A GE 331 pilot lamp is connected in each collector circuit of the flip-flop so it is very easy to observe the repetition rate as the 25K ohm RATE potentiometer is varied.

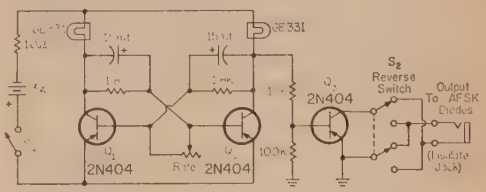



Fig. 1—Schematic diagram, W2JAV Dot Generator.

### Construction

The W2JAV Dot Generator is built into a little aluminum "mini-box" such as the Premier AMC-1001. Its size is 3¼ × 2⅛ × 1⅝ inch. The 3¼ × 2⅛ inch face of the box mounts the reversal switch $S_2$, the RATE control, and the two GE 331 pilot lamps. These are mounted in tight-fitting rubber grommets and connections

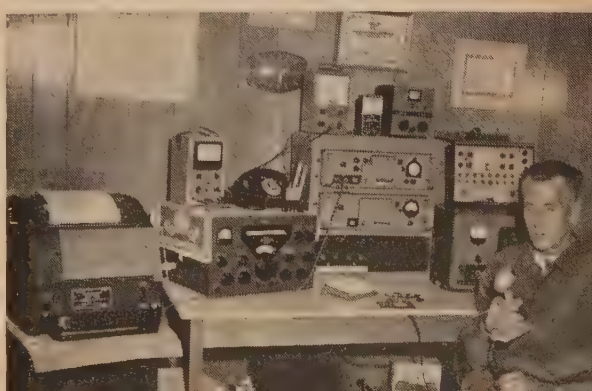
[*Continued on page 106*]

*431 Woodbury Road, Huntington, New York.

## *RTTY The Hard Way.....No. 14*

"I found a place to get a deal on perforator tape, but they had a heck-of-a minimum buy."

KØYUS, Station of Palmer Refseth, Marshall, Minnesota.



# VHF

DONALD L. STONER*, W6TNS

One of the newest and absolutely the most fascinating developments in the maser program is the optical maser or laser. The principle of the optical maser is similar to the microwave version and was described by Townes and Schawlon in 1958. Two years later the first working optical maser was demonstrated by Hughes Research Laboratory. The optical maser is also a parametric device and uses ruby or impurity doped crystals operated at very low temperatures. The ruby rod is pulsed or pumped with xenon flash tubes similar to those used in photographers electronic flash units. When the lamp is triggered, its flash stimulates the ruby rod which then emits a spectacular beam of coherent light. You can think of this as light amplification with gains of many million times. The most important aspect of the beam generated by the optical maser is that light does not fan out appreciably but tends to stay confined to a pencil thin beam for tremendous distances. This produces the same effect as a diffused source which is concentrated by a parabolic reflector. However, to equal the performance of the optical maser, the parabola would have to exhibit infinite gain.

The beam generated by the optical maser can also be spread or concentrated using focus schemes. The field of beam concentration shows great promise. For example, the beam can be concentrated to be only a few microns thick (about 1 wavelength) with energy densities of $10^8$ joules per square cm. Such a narrow beam can drill holes in tough steel yet is delicate enough for optical welding. Optical masers can be used to kill a single cell without disturbing its neighbor. Detached retinas can also be spot welded back in place using the lens of the eye to concentrate the light in the desired area. Optical radar is not only practical but is so far superior to the microwave methods that it can be expected to completely replace all but the most inexpensive existing systems. For example, it is possible to communicate for astronomical distances far beyond the range of radio telescopes. Even a simple optical maser can map the surface of the moon with a spot only 10 miles in diameter! How would you like to concentrate your two meter signal like that?

Incidentally, the optical maser can be deadly. Any device which can drill holes in steel with concentrated light can play havoc with human composition! It is dangerous to look at even reflected light from the optical maser without eye protection. This is the reason for the "death ray" publicity carried by the news media seeking sensationalism. What a way to deal with TVI complaints! Click, Zap, Poof — back to working skip. Viva la laser!

*Alta Loma, California.

### QTH

Of prime importance this month is to draw your attention to the QTH at the head of the column. The civil servants in Ontario no longer honor the forwarding order and I understand a good deal of mail has been returned to the senders. Needless to say this has caused no end of problems and needless reader expense. The above address should be used for *all* mail.

### Oscar Award

I would like to take this means to thank Andy Clark, W4IYT, and the gang at *Florida Skip* for their thoughtfulness in presenting me with an award in connection with the OSCAR program. However, as I have said many times, the entire credit for the success of the program belongs to the OSCAR Association and the wonderful gang connected with it. If there are any more awards to be given, send them to Sunnyvale and in the name of the association. This is where they belong.

Speaking of OSCAR, it is appalling the number of people who tracked the satellite and didn't bother to send in reports. What do they have to do, light a bomb under you guys? Several people have mentioned receiving OSCAR for long periods—some up to 32 minutes—yet no reports were made! "I didn't think they would be interested", is the typical comment. A lot of people worked a lot of hours to get that tin can up there. Certainly you could spare a few minutes each day for three weeks, in return.

### The Moonbounce Circuit

Lambert Ledoux, ZS6IF, 101 Lyndhurst Rd., Johannesburg, So. Africa, dropped a line recently with a tasty tidbit. Besides prodding me to do something constructive in the way of parametrics, Lambert mentions that he is busy building gear for moonbounce on 144 and 432 with W4PLL or anyone else who would like to give it a try. Six intermediate frequency plans to use a couple of helices (perhaps a bank of 8 but more likely four with automatic tracking. The power will be around 500 watts or so depending on special permit from Post Office department. The normal legal limit is 100 watts on any band. Lambert will keep us posted on his progress but it will be slow going since everything must be built by himself. He would like to correspond on the subject of parametric amplifiers.

Speaking of "lunar-tics" here's more information on the Alaska moonbounce operation, courtesy of Bob Hunsucker, KL7CYS. "For many 'moons' now our group at the Geophysical Institute at the University of Alaska has been planning to conduct a two meter moonbounce experiment between here and the 'lower

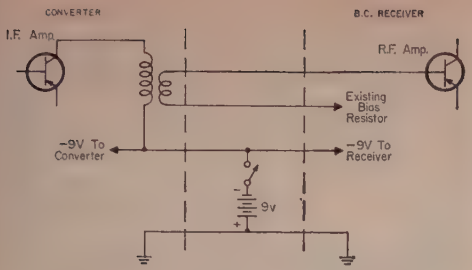



**Fig. 1—Method of connecting a transistorized v.h.f. converter to a slightly modified 8-transistor BC radio. The existing BC-set antenna coil should be removed and it's variable capacitor used to tune the converters' output coil.**

48' states. After many delays and difficulties it appears that we will be ready to go during the week of 9-16 September, 1962. We would greatly appreciate all efforts to contact others interested in and set up for moonbounce work. Here's the pertinent particulars: *Call:* The "Voice of Alaska Amateur Radio Club" call, KL7AVD, will be used. *Frequency:* In the vicinity of 144-2 mc, the exact frequency will be announced later. *Equipment:* 416B preamp into Ameco Nuvistor copy into R 300 receiver with 100 cycle bandpass. Xmttr: 8 mc xtal oscillator in temp, controlled oven followed by usual multiplier string into 4X25OB final running at 1 kw input. *Antenna:* (get this) Parabolic dish 61 ft. in diameter, steerable in alt. and azimuth. Provision for linear of circular polarization. Calc. gain at 144 mc is 26 db. *Personnel:* Paul Albee, W7ZEA/KL7, Bob Hunsucker, KL7CYS, Rudy Domke, W8LSS/KL7, Lou Bain, KL7CUH, Jim Mackowiak, KL7DVO, and Will Sarner, KL7CEN. *Operating Shed:* c.w. transmission for five minutes starting every quarter hour
*Sked:* Monitior 14.310 u.s.b. using call KL7AVD from 2230 to 2300 G.M.T. every day. *Correspondence:* For more info. contact Robert Hunsucker, Geophysical Institute, University of Alaska, College, Alaska.

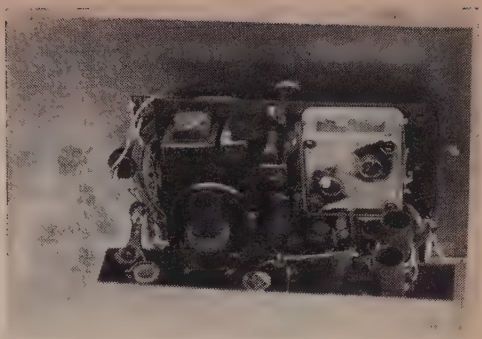
## Let's Get Technical

Here's a project I like to call the littlest Communicator. Recently I constructed a converter for the OSCAR program (to be described in a later issue) which was completely transistorized, yet had a noise figure on a par with tube jobs. Rejection of spurious signals was a lot better than many tube converters, too.

One day, when pranking with some Japanese transistor radios, I decided to convert one to a tunable i.f. to use with the converter. The two units were mated in a chassis box to make an extremely compact double conversion superhet. The performance was amazing and the unit pulled in anything that could be heard on the Pawnee! The only shortcoming is the one megacycle tuning range. Guess you can't have everything, though.

Figure 1 shows the way in which the two units were tied together. You can modify just about any radio for this purpose and the conversion trick should work with other converters such as the International Crystal "Mobilettes". The antenna coil is replaced by the output coil in the converter and the base current for the mixer oscillator is fed through the link on the converter output coil. Obviously lower frequency converters can

**Fig. 2—A simple and compact 300 ohm to 75 ohm balun for two meters. The 26½" length of RG-58/AU may be coiled up to fit inside a minibox. Cables should be grounded to the minibox at both ends.**



**Inside view of the Littlest Communicator showing the six-transistor receiver modified as a variable i.f. A portion of the OSCAR converter can be seen. Note there is room on the left side for a transmitter—but where can I put the modulator??**

also be tied to the transistor radio, if you're inclined to listen to the d.c. bands. The only requirement is that the output coil in the converter track with the tuning capacitor in the transistor radio. For this application the Japanese 8-transistor radio is recommended. The 6-transistor version uses a converter circuit where the mixer and oscillator are combined inn one unit. The 8-transistor versions use a separate oscillator transistor making the operation of the mixer much less critical. In all cases the antenna loopstick must be replaced by the mixer output coil. Otherwise the radio station pickup will blot out any stations picked up by the converter. Extremely sensitive receivers will have to be mounted in a metal chassis box.

Emil Carver sends the sketch of a compact balun which he constructed for the two meter band. It is enclosed in a 4" × 3" × 4" metal box by coiling up the coax. Emil claims that it has much less loss than commercial broad-band types. The circuit for the balun, which converts unbalanced 75 ohm cable to 300 ohms (or the other way around), is shown in fig. 2.

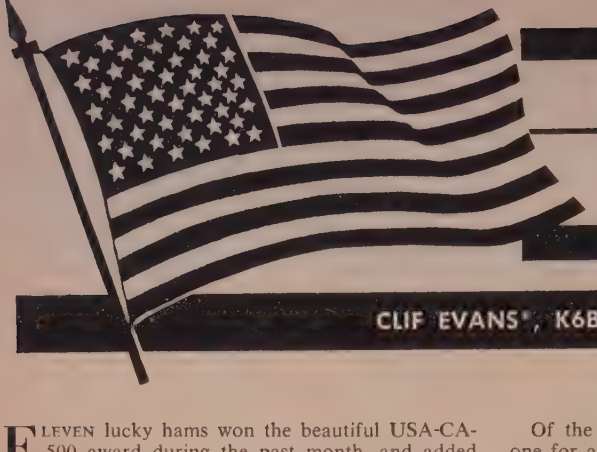
## VHF Around The States

Six meter sideband activity is growing by leaps and bounds. The P&H Sideband Converter is doing a tremendous job and contributing significantly to the success of this mode on six. I plan to have a comprehensive write-up on this fine unit in next months column.

James Barnes, K9TFJ, fills us in on the sideband activities in his neck of the woods. "The hams on six meters around Indianapolis are showing a lot of interest in sideband. First on was K9PED, Larry, followed by K9YIA, Jim; K9YTG, Hal; K9CGQ, Earl; K9PUI, Howard; K9CGR, Betty; K9KGJ, Bob; K9ICI, Sam; K9KJD, Ray; K9UPG, Kia and K9TFJ, Jim. Most are using Central Electronics s.s.b. gear plus P&H or Bycraft Transverters. However, K9YPG is using an SB-10 with the 10 meter band converted to six meters" (How about some dope on making this conversion, Kia? A lot of people would like to do it). Jim is using an SB-10 with a Two-By-Four modified for six.

Here are some sage words by Eric von Valter, W8IRO, as appeared in *The Michigan Open Mike* published by the Michigan Six Meter Club. "The biggest problem confronting the Technician that I can perceive is the matter of education. For some reason, the rest of the fraternity seems to regard the Technicians as leppers because they can't copy 13 per (I'd sure like the pleasure of testing every general in existence today at 10 w.p.m.). Hundreds of times I've heard remarks such as, 'Yeah, I know Joe. He's a Technician and can't do a good job of tuning his Gooney-bird'. Ironically, it is never the same guy who says, 'Joe doesn't know too much yet. I'd better give him a hand'. Well, it takes two to learn: one to teach and one to learn."

With those "if the shoe fits" comments I fold my dipole and sneak away to join the Arabs. More news and views next month so keep those cards and letters coming. 73, de Don, W6TNS



# the USA-CA PROGRAM

CLIF EVANS*, K6BX

ELEVEN lucky hams won the beautiful USA-CA-500 award during the past month, and added some interesting news in the doing.

Dave, K3HNP, with the VHF Amateur garnered many of his contacts on v.h.f. adding to several others who have proven v.h.f. is a highly effective route to working counties and for awards.

Curtis, WN4EBE, kinda set the OLD MAN back on his heels when he was first Novice to apply for USA-CA. This being one for the 'books' we checked him out closely. Curtis set his goal for USA-CA and went all out using Novice 15, 40 and 80 meter bands. We noted that while most of his contacts were with other Novices, many Generals also helped him on Novice frequencies. His next goal is USA-CA-1000. Curtis comments that he prefers using a Rand McNally Premier World Atlas which lists towns/counties down to a population of 50. He also opines that in accumulating contacts with 500 U.S. counties he became endowed with a liberal 'education' in U.S. Geography.

**USA-CA-500**

| | |
|---|---|
| W9DGA ....118 | W6NUQ ....125 |
| K9AMD ....119 | K7GTK ....126 |
| XE2DS .....121 | K9AZX ....127 |
| K8YBU ....122 | W8UPH ....128 |
| WN4EBE ...123 | K3HNP ... 129 |
| VK3XB ....124 | |

*United States of America Counties Award Custodian, Box 385, Bonita, California.

Lloyd Colvin, W6KG, shown holding the Arne Trossman CHC-200 Top Honors Plaque presented to him at the ARRL National Convention, Portland, Oregon. Joe Naemura, W7GXA, of the Williamette Valley DX Club, standing, made the presentation representing Arne Trossman, Editor, CQ. In the foreground is Rundy Rundlett, W3ZA, FL8ZA, *etc.* For full information on the Top Honors Plaque, see April issue CQ. *(Photo by K7GCO).*

Of the above, seven were for mixed operations, one for all A3, and three for all c.w. We note also that No. 119 is Carole, who has written many feature articles for *CQ*. Then there is No. 122, Ross, who was first Novice in world to win over 25 achievement awards qualifying for membership in CHC.

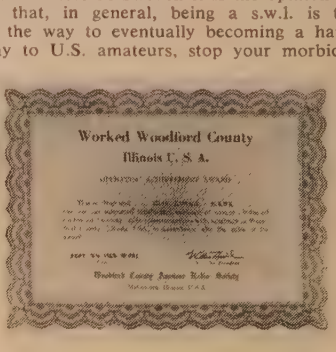
**We Get Letters and Questions**

**W8FKU, George,** "Dear OLD MAN . . . want you to know I subscribed to *CQ* because of your outstanding column plus fact *CQ* carries far more v.h.f. news than any other magazine."

**LU1DAB, Juan,** "Dear OLD MAN, thank you from the depths of my heart for the extraordinary and beautiful USA-CA . . . cannot find words to describe it . . . gorgeous . . . be assured we will proudly show it to amateurs down Buenos Aires way." (See picture of USA-CA in July issue *CQ*)

**Irving R. Potts.** President & Editor. Newark News Radio Club, "Dear Clif, It is my intention to bring up your excellent job in behalf of the s.w.l. fraternity, at next officers, editors and directors meeting. From the comments I have heard, your efforts are really appreciated."

**SM7TE, Kjell** (via ASWLC), "I am Head Editor, Malmoe Shortwave Club, BC publication, even though I am an active ham. In our BC publication we devote 10% to hams as at least 15% of our s.w.l. members are also licensed hams. We also sponsor a ham diploma, Worked/Heard 3 MKVK amateurs. In the Sweden publication for SSA, the QTC, you also will find a s.w.l. column. Here in Sweden it is the opinion of most amateurs that, in general, being a s.w.l. is the first point on the way to eventually becoming a ham. . . . so we say to U.S. amateurs, stop your morbid vanity




Pictured here is the gold Worked Woodford County, Illinois Award, WWCI, by the Woodward County Amateur Radio Society, for working stations in Woodward county. W/K/VE work any four stations; DX/KH6/KL7 work two. Send GRC list (certified list), 50¢ or 4 IRC to Society, c/o K9ZQW, Willis Hodel, RR #1, Metamora, Illinois.

and accept U.S. s.w.l. and encourage them to become ham friends."

**VE3-9301, Fred Woodley,** Chairman, Canadian DX Club, "Many thanks for the wonderful news the Directory of Certficates will sponsor the new SWL-CHC program effective January 1st, 1963. This has been long awaited for by a considerable segement of the SWL population. . . . you are to be commended for taking this step and lead toward both increased enjoyment for us, as well as toward further welding relations between ourselves and our 'big brothers' the hams." (Details on SWL-CHC is elsewhere in this text)

**G2BVN, Steve,** (Staff, *RSGB Bulletin*), "Mailman just brought the duplicate USA-CA issued to G3DO. It is a beautiful job. . . . Would grace any ham's shack, and fully deserve the high praise already bestowed upon it. It will be displayed at RSGB's International Radio Communications Exhibition at which the Surrey CHC Chapter #8 has an awards exhibit booth."

**K4ADT,** "Have just finished my six months stint serving 'Uncle Sam', so am now back home and eager for the hunt. . . really admire you for the tremendous fun you've generated in boosting and publishing all the various operating achievement awards programs. The QSL is the final courtesy of a QSO and awards programs add significant purpose and value to such QSLs. USA-CA is my next goal."

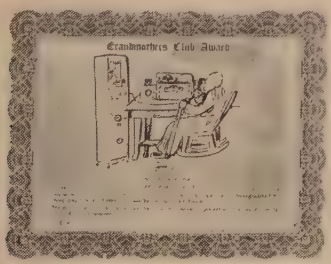
**W7UYZ, Glenn,** ". . . many hams appreciate the FB job you are doing promoting all categories of both operational and personal achievement awards. I know of many hams now motivated to obtain higher class licenses and to increase their code speed just because of CHC. Your programs have stimulated new life and purpose in hamming. . . . today, every time I turn on my RX, I hear 'CQ-CHC'."

**W2RED, Bill,** "After reading your outstanding USA-CA column, I phoned the Editor of *CQ* to learn price of your famous 'Award Hunters' Bible'. Why not publicize information on your *Directory* and your DX-QSL-News Letter plus the new Directory EXTRA News Letter. (See *Directory* and DX-QSL-NL ads in November issue *CQ*)

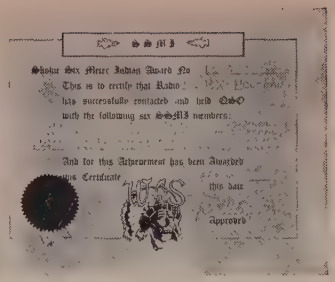
**K5SNH, Ken,** ". . . want to thank you and *CQ* for making this wonderfully enlightening USA-CA Program available to us . . . put me down for the USA-CA Good Will Club to help DXers indentify U.S. counties. By the way, you might tell readers the Post Office has raised price of P.O.D. No. 26, from $2.25 to $2.50. (P.O.D. No. 26 is annual publication of the Post Office Department which lists all U.S. cities and towns with county identity)

**Grandmothers Just Everywhere**

You know 'we' have an award for working grandmothers but few have been issued because the boys chicken out when it comes to asking a gal over the air if she's a grandmother. Can't blame them. We admit it has been one award we've coveted but always got cold feet when it came time to pop the question.




Pictured here is the Grandmothers Club award for working ten grandmothers . . . providing you can identify them as such. So far, we have identified 48 grandmother hams. We know this group is highly active because 11 of them are CHCers. Certificate courtesy Kay, K2UKQ.




V.h.f.ers can win the above Worked All Skokie award on six meters. Stations within 50 miles of Skokie, Illinois, work 6 Skokie stations on six meters; others work 3. No charge. Send own QSL card listing full data to Skokie Six Meter Indian Net, c/o Yale Saffro, K9BDJ, 7841 Kildare, Skokie, Illinois. While calling themselves a "Net", this group functions as a Club with regular meetings weekly.

Guess we shouldn't be too bashful though because the grandmothers are poking a bit of fun at us by making it part of the rules that you must 'pop the question'.

There was a day when gals didn't like to be identified too publicly as grandmothers. . . . but times have changed and, today, it's hard to tell daughter and mother from grandmother. Now that ought to get me squared away for the secrets I'm about to reveal.

To get the grandmother award, you must identify and work ten of them after March 17, 1958 and send log data list (no charge) to Custodian, Anita Rukman, K9HCY, 529 West Frech St., R.R. 4, Streator, Ill.

To give you a head start with warm feet, the OLD MAN has identified the following lovely grandmothers . . . there are many more, naturally, and they are invited to join the club. Grandmothers, (we think): W1MOI, W1RLQ, W1YPN, W2BNC, K2PMR, W2RUF, WA2QGX, K2UKQ, K4JYQ, K4RNS, W4SGD, K5BGT, K5MPI, K5YIT, K5BTM, W6AAX/Ø, W6DXI, W6HTS, W6QVK, K6UHI, W6WBH, K7ADI, K7BII, K7BKI, W7TGG, W7WLX, W8FPT, W8HAV, K8MZT, K8NGR, W9AXV, K9CCO, K9JVL, W9JYO, W9MIE, W9RTH, W9RUJ, WØATO, WØBHQ, KØBOF, KØEOW, KØGIC, KØGZO, KØMAS, WØMRJ, WØMVT, WØZWL, KH6AFL, KH6BTX,

If other grandmother hams feel slighted, write us and we'll add you to the list another appropriate day.

**Colorado Joins USA-CA Program**

Mighty proud to let you know a live-wire group of gals over in the "Nil Sine Numine" state have announced sponsorship of a Worked All Colorado Counties, WACC, award and opened up the good state of Colorado to "unlimited fun" and publicity.

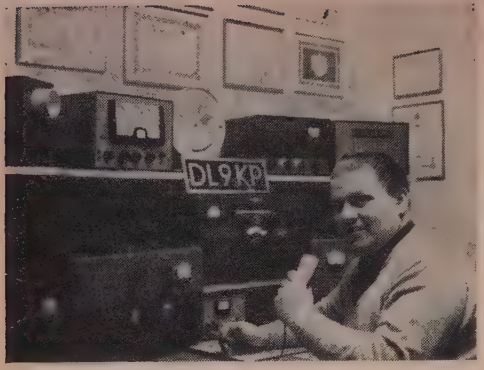
The WACC, sponsored by the Colorado YLS Club, will be for confirmed contacts with specific numbers of Colorado counties after WW II, issued in the following classes: A is 63 counties, B is 55, C is 45, D is 30, E is 15. A special award will be given for class A. All classes will be specially endorsed for all one band or mode or mixed operations, AOMB/M.

To get the award send GCR (certified) list with full log data and 50¢ to club Custodian, Marte Wessel, KØEPE, 1635 Tamarac St., Denver, Colorado. Send s.a.s.e. for B, C, & D Seals, and return postage for Endorsements for B, C & D to return certificate to applicant.

The certificate is now being designed by a committee consisting of Tillie, KØRGU; Marte, KØEPE, and Lola, KØRXK. You can just bet it will be attractive. When it is off the press we will bring you a picture of it in later issue.

**Fourth New Mexico QSO Party**

The CHC Chapter #1, New Mexico, announces its fourth New Mexico QSO Party during a 36-hour period from 1500 GMT Saturday, January 26 to 0300 GMT Monday, January 28, 1963. Put these times and dates on your calendar.




**Pictured is Paul, DL9KP, of DX-Pedition fame, who recently has achieved CHC-200 Top Honors and the Arne Trossman CHC Top Honors Plaque. Some of the new equipment Paul has added to his shack gives mute evidence as to why he has such a potent signal, worldwide. He has the latest Hallicrafters HT-32B and HT-33B. As standby equipments he has a Valiant and KWS-1. He also has an SX-101 and a 75A-4 receiver. For antennas, Paul uses a 73-foot E-Z Way tower with High-Gain 4-element, a 2 meter Mosley 14-element Yagi, a W3DZZ Longwire, and an all-band ground plane. Paul passed along information that groundwork is being taken to form a Germany CHC Chapter soon. He also passed along 73 to the OLD MAN from YK7YS who Paul worked in September on 21 mc.**

Prime purpose of the QSO Party is to assist those interested in contacts toward the New Mexico Counties Award, the Amigos De Albuquerque Award, and the USA-CA. (For information on NMCA see November 1961 *CQ;* for the Amigos award, see September 1962 issue *CQ*)

QSO Party Rules: All bands can be used and same station may be worked for additional credits on different bands. Phone and c.w. contacts on same band counts as two credits. For New Mexico stations: one point per contact and multiply total by the number of states, US Possessions, Canadian Provinces and foreign countries worked during contest period. Stations outside New Mexico count three points per New Mexico station worked and multiply total by the number of different counties in New Mexico worked during the contest period. New Mexico stations send number of QSO, RST or RS and county. All others send number of QSO, RST or RS and name of state, Possession, Province or country. Logs must be postmarked not later than February 28, 1963 and be sent to CHC Chapter #1, New Mexico, c/o John C. Kanode, K5UYF, 408½ Cornell Drive SE, Albuquerque, New Mexico.

Special awards will be issued to winners each state, country, Canadian Province and U.S. Possession. New Mexico hams will hang out near the following frequencies: 3600, 3835, 7030, 7250, 14080, 14250, 21050, 21300, 28100, 28600, 2900 kc and 50.28 mc. All active New Mexico hams are expected to join the QSO Party and many 'rare' counties are promised.

### Gateway To West Award

St. Louis Area CHC Chapter #6, announces sponsorship of the Gateway To The West Award to publicize the historical route of the Lewis & Clark expedition.

The award is for contact with all states through which the Expedition passed, and certain cities within most states which represent the nearest city to original major encampments of the expedition. Such states are Missouri, Kansas, Nebraska, North Dakota, South Dakota, Iowa, Montana, Idaho, Oregon, and Washington.

Award requirements: Make two contacts each with St. Louis, Mo., and Portland, Oregon; one contact with four of the following five specific cities: Omaha, Nebraska; Pierre, South Dakota; Bismark, North Dakota; Helena, Montana; Council Bluffs, Iowa; plus one contact with any city in the remaining states of Idaho, Kansas, Washington and the state in which a specific city of the five listed was not worked—making total of 12 contacts. No time limits; no endorsements available.

To get award send GCR (certified) list and 50¢ or 6 IRC to CHC Chapter, c/o Custodian, KØBQI, Joe Millen, 3224a Nebraska St., St. Louis 18, Missouri.

Here, again, is example of an amateur award which promotes both 'memory' and knowledge of our historical beginnings. Just think of the sensations the Lewis & Clark experiences would have caused in their time had they had amateur radio communications . . . if you haven't read their exciting adventures, you've missed some highly entertaining reading. Put it on your 'do' list.

### Kentucky in USA-CA Limelight

Back in May issue we flashed news that Kentucky was planning to join USA-CA in a big way. Here it is.

The Owensboro Amateur Radio Club, Owensboro, Kentucky announces sponsorship of four significant Bluegrass awards programs which should bring much favorable publicity to the state of Kentucky and its hams.

### The Bluegrass Counties Award

Kentucky has 120 counties; however about 50 have no or few active hams. The approximately 2000 hams in Kentucky live primarily in the larger cities. . . . approximately 500 in the Louisville area alone. For this reason the counties award is offered in several classes, as follows:

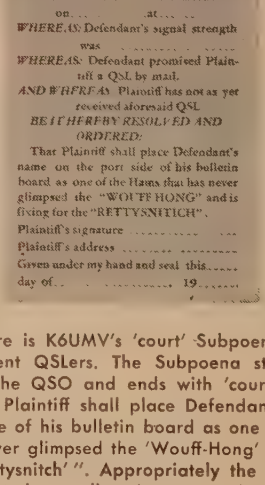
Class C. Continental USA stations work 20 Kentucky counties; others 12.

Class B. Continental USA stations work 40 Kentucky counties; others 25.

Class A. Continental USA stations work 60 Kentucky counties; others 40.

Class AA. USA work 80 or more counties; others 60 or more. When any operator can present QSLs certifying contacts with all counties, the club will 'arrange' a 'unique' All Kentucky Counties Award.

OLD MAN's comment: The Owensboro club plans to run a few county expeditions to 'rare' counties and also possibly a Kentucky QSO Party to facilitate contacts with the Bluegrass state. Such will be duly announced.



SUBPOENA

COURT OF CONSEQUENCES
STATE OF CONFUSION

. . . . . PLAINTIFF
. . . . . DEFENDANT

*WHEREAS:* Plaintiff worked Defendant on . . . at . . .

*WHEREAS:* Defendant's signal strength was . . . .

*WHEREAS:* Defendant promised Plaintiff a QSL by mail.

*AND WHEREAS* Plaintiff has not as yet received aforesaid QSL

*BE IT HEREBY RESOLVED AND ORDERED:*

That Plaintiff shall place Defendant's name on the port side of his bulletin board as one of the Hams that has never glimpsed the "WOUFF HONG" and is fixing for the "RETTYSNITCH".

Plaintiff's signature . . . . . .

Plaintiff's address . . . . . .

Given under my hand and seal this . . . . . day of . . . . . 19 . . . . .

**Pictured here is K6UMV's 'court' Subpoena he serves on delinquent QSLers. The Subpoena states circumstances of the QSO and ends with 'court' admonishment "That Plaintiff shall place Defendant's name on the port side of his bulletin board as one of the Hams that has never glimpsed the 'Wouff-Hong' and is fixing for the 'Rettysnitch' ". Appropriately the Subpoena is printed on yellow (quaranteen) stock.**

### The Bluegrass Commonwealth Award

The Commonwealth of Kentucky is divided into six natural regions for both natural and political reasons. Boundaries of such regions are fairly specific. These regions are The Bluegrass (33 counties), The Jackson Purchase (8 counties), The Knobs (13 counties), The Mountain (28 counties), The Pennyrille (27 counties), and The Western Coal Fields (11 counties). (Write club for map showing regions and counties therein)

The Bluegrass Commonwealth award requirements are: Kentucky station work 3 stations in each region, continental USA stations work 2, and others work 1 each of the 6 regions.

### The Bluegrass Cities Award

For this award, continental USA stations work 3 stations in Louisville, 2 in Owensboro, 1 in Lexington, 1 in Paducah and 1 in Covington plus any 4 in the following: Ashland, Henderson, Hopkinsville, Bowling Green, Paducah, Madisonville and Frankfort (12 contacts). Canadians work any 7 cities; others work any 6 cities.

### The Bluegrass Colonels Award

As you know, Kentucky is famous for pretty horses, fast women and just 'everybody' is a Colonel. So to get the Bluegrass Colonels Award, Kentucky stations contact any other 50 Kentucky stations; continental USA work 30, Canada work 20 and all others work 15.

All the above awards will be endorsed all one band or mode or mixed operation. Mobile and portable operation count provided QSL plainly states exact QTH at time of contact.

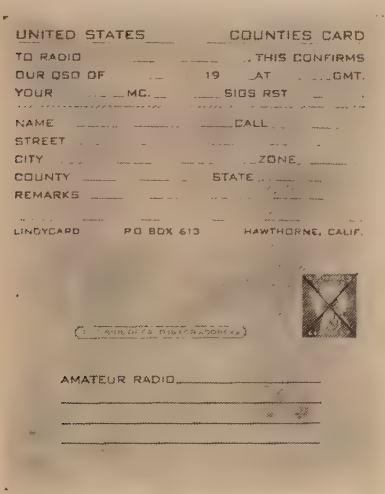
To get these awards, apply with GCR (certified) list, with 50¢ or 5 IRC to Custodian, Daniel F. Onley, K4ZRA, 2539 Christie Place, Owensboro, Ky. All four certificates are different.

The certificates proper, as we write this, are in print. We will bring you pictures at a later date.

### Georgia Joins USA-CA Parade of Awards

The Columbus Amateur Radio Club, Inc., announces new sponsorship of the Worked All Georgia Counties Award, WAGC, with more realistic rules.

As many know, the previous sponsor, Georgia SCM, had rules which required working all 159 Georgia counties. As a consequence hams the world over blacklisted the award as ridiculous, and Georgia hams suffered as a consequence of sad-sack public relations.




Simple but 90% effective. Pictured here is the USA-CA special QSL card used by W6UBP, Fred Lindquist. It is printed on the already stamped double post cards obtainable from the Post Office. It emphasizes the naming of one's county. Fred says that since he started using this special USA-CA card, returns have been averaging about 90%.

Here is the Bucks County Award by the Bucks County Amateur Radio Club, Penna., for working members, after January 1, 1961. Stations within 100 miles of Levittown, Pa., work 10; others 5. Send QSLs and return postage only to Custodian, Dave Heller, K3HNP, 14 Darkleaf Lane, Levittown, Pa.

All hamdom will welcome the new rules and there now should be high interest and activity in Georgia's next annual Amateur Radio Week in May, 1963.

New WAGC rules are: Class IV, work 40 Georgia counties; Class III, work 80; Class II, work 120, and Class I, work all 159. The previous requirement that QSL must be mailed in county it confirms has been dropped. Endorsements for all one band or mode or mixed. Contacts after November 15, 1945. Send QSLs, list and $1 or 10 IRC to club, c/o Custodian, John T. Laney, K4BAI, 3500 14th Avenue, Columbus, Georgia. No charge for endorsements except appropriate return postage.

### QRP Club Correction

September issue pictured the new QRP Club award and stated classes started for working 5 members, or 10, or 25, etc. This club has jumped to several hundred members. In order to uphold awards standards, the two lower classes have been dropped. The lowest class of the award now is issued for working 25 members. For awards rules and member list, send s.a.s.e. to K4WVX, Jim Perry, 2691 56th St., North, St., Petersburg 10, Fla.

### QRP CHC Chapter No. 9

QRP CHC Chapter No. 9 was officially commissioned on September 5, Lest there be misunderstanding, the CHC QRP chapter has absolutely no connection, affiliation or relationship with the QRP club mentioned above. They are two entirely different groups with entirely different objectives.

Membership in the QRP Chapter is open to CHCers and HTHer Associates (Associate requirements not yet established), who operate with low power described as 100 watts input to the final on a.m./c.w. or 200 watts or less p.e.p. s.s.b., except for public service activities when increased power is necessary.

The purpose of the CHC QRP Chapter in addition to furthering CHC purposes is to advance knowledge of QRP operation and procedures. The Chapter does not advocate reductions in legal power limits for any country.

The Chapter is operating with intrim officers of President, Vice-President, Secretary/Public Relations until elections can be held. Inquiries should be sent to Secretary, K8TBR, R. J. Liggett, 817 Springfield Drive, Charleston 2, West Virginia. Membership will be international.

The 33 members as we write this are W1DMD, W1HGT, K1MBM, K1NOL, W2EMW, K2UAR, W3AIZ, K3CNN, K4HPR, K4MPE, K4NTS, K4WVX, K5USE, WA6AJF, W6ETR, WA6NHC, K6UMV, W7CNL, K7SQD, K8KFP, K8NHC, K8TBR, W8WUT, K9TZH, W9LNQ, KØBQI, KØYIP, K94AQQ, VE2IL, VE3IZ, VE7BBB and ZL1ARY.

### New SWL-CHC Awards Program

The *Directory of Certificates and Awards* announces the new Short Wave Listener's Certificate Hunters' Club program effective January 1, 1963. The club, short

title SWL-CHC, will be similar in organization and membership requirements as for the present Certificate Hunters' Club, except awards won will, naturally, be on a heard basis.

Basic membership in SWL-CHC requires the s.w.l. to hold at least 25 amateur type achievement awards and such awards must be listed in the Directory. (there are several hundred available). The special SWL-CHC membership certificate will be 11x14", gold, with design for up to 6 two-inch gold seals with ribbons. Seal endorsements signify holder has amateur-type awards in steps of 25, 50, 100, 150 and 200, and awards from at least 25 countries and from all six continents.

Life membership in SWL-CHC is given for $1. No charge for seals, and separate special awards free at 150 and 200 level. No dues. No assessments; therefore all correspondence must include s.a.s.e.

We have received some correspondence expressing disappointment SWL-CHC does not permit counting all type s.w.l. awards by whomever issued. We appreciate the viewpoint; however, it is our prime purpose to promote closer affiliation between s.w.l.s and licensed amateurs under conditions we can control and administer under provisions of Directory listings. In effect, SWL-CHC is separate from but companion to CHC, and all normally applicable CHC rules will also apply. Stated "Purpose" of the SWL-CHC, among others, are:

1. Promoting closer fraternal relationships and friendships between the world's s.w.l.s and radio amateurs, and concept s.w.l. and hams are natural fraternal 'kin'.

2. Bringing about bettered Public Relations between s.w.l.s and hams with more realistic publicity of associated contributions *both* make to the art and science of human communications by whatever media.

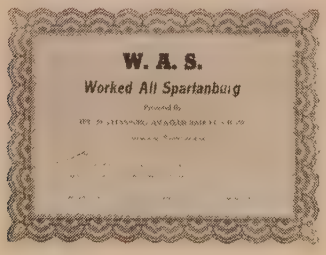
3. A joining of hands between s.w.l.s and hams toward efforts seeking People-to-People goals toward better understanding, trust and goodwill among the world's peoples.

4. Directing public attention to the 'fraternal kin' between s.w.l.s and hams, and their joint value to society, and to the public and national interests.

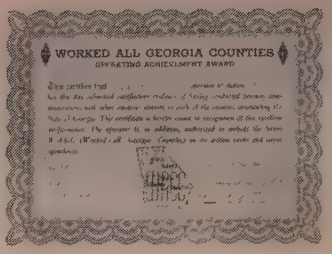
5. Encouraging s.w.l.s, wherever possible, to multiply their hobby pleasures, and contributions to society, by becoming licensed radio operators.

6. Promoting concept that systems, facilities and organizations which provide services to s.w.l.s or hams should jointly and mutually accomodate *both* in programs.

While the SWL-CHC officially becomes established January 1, 1963, applications will be accepted in advance, and those qualifying for membership may, during December, vote for club officers for President, two Vice Presidents, an eight-man Awards Advisory Board, and a SWL Sweetheart. The OLD MAN, K6BX/WPE6OJ will act as Secretary. The club is non profit; there is no club treasury and the Secretary will bear all authorized club expenses. Correspondence (with s.a.s.e.) to SWL-CHC, Box 385, Bonita, California.




Pictured here is the new Worked All Spartanburg, W.A.S., certificate sponsored by the Spartanburg Amateur Radio Club, Inc., Spartanburg, South Carolina for working Spartanburg County stations. Requirements are: District 4 call area except Florida, work 10 Spartanburg county stations of which 2 must be SPARC members; rest of U.S. including Florida, work 5 of which 1 must be member; others work just 2 stations in the county. Send certified (GCR) list (no QSLs) and 50¢ or 4 IRC to Custodian, Bill Roff, WA4AEB, Pineville Rd., Spartanburg, S. C.




Pictured here is Worked All Georgia Counties Award sponsored by the Columbus Amateur Radio Club, Inc., for working Georgia Counties in four classes.

**What's Cooking Department**

As you've noted, much of our column is about things still in the cooking stage . . . we just get a whale of a bang out of being in on the ground floor for 'things' still on the horizon.

Nice letter from the boys at North Dakota State University Radio Society who are in 'Committee' working out details on a new North Dakota State Counties Award, NDS-CA. Know hams the world over will welcome both the awards program and increased North Dakota activity Okay, just be patient and we will bring you both details and picture of North Dakota's first entry into the awards field for better public relations.

The Kodiak Amateur Radio Club has folded and the previously announced certificate for working five stations on Kodiak Island has been cancelled. This information comes from H. S. Pickerill, KL7EKS (ex W4LRL, W5TBE, K7KLS, W9GOK, KM6BK) who was assigned the defunct Kodiak Club call for his use. He states that while he is not, and was not, a member of the club, he has obtained what was left of the Kodiak Club's certificate blank forms and will issue same so long as they last. He noted also that FCC was requested to assign call KL7AWR to him in connection with a 'recreation' station.

Bob, K1CXP, had so much fun last July giving out expedition contacts from 'rare' Coos County, New Hampshire, that he has now moved there permanently so he can enjoy continuous pileups. QTH, 9 Underhill St., Nashua, New Hampshire.

County awards programs are still cooking for South Dakota, Alabama, Iowa, and Pennsylvania. We will keep you informed.

**"USA-CA Fun Unlimited"** – Like the OLD MAN keeps telling you, the USA-CA Program adapts itself to all contests, all QSO Parties and all Field Days. It is a bit foolish to enter any contest for any 'one-shot' purpose when normally accumulated contacts and resulting QSLs are credits toward many attractive and 'valuable' awards sponsored by those who seek your friendship and goodwill.

As you know, the USA-CA Program supports all awards regardless by whom sponsored. Might we suggest that hamdom's interests would be better served if a majority of contests and QSO Parties included provisions in rules which also purposefully supported others besides themselves. It is only natural the USA-CA column will give priority publicity to contests and Parties which include the 'work counties' concept which is instrumental in supporting many awards. When we say "support many awards", what we really are saying is that you are joining with others in creating better public relations through more intelligent use of the contest/QSO Party/awards PR vehicle. Keep the letters coming.

May the Good Lord continue to bring you health and happiness in the coming year.

A Merry Merry Christmas, 73, the OLD MAN, K6BX

# SPACE COMMUNICATIONS

GEORGE JACOBS*, W3ASK

THE OSCAR gang once again seem to have accomplished the impossible. A breadboard model of a repeater satellite, thought to be impossible to design a few short months ago, is now working successfully on the ground, and is expected to be flight-tested from an airplane by the time this appears in print.

The breadboard translator, which may eventually become OSCAR III, is operating into a quarter-wave whip antenna with a peak transmitter power of about one watt. The translator picks up a 50 kilocycle band at 144.1 mc and rebroadcasts it simultaneously at 145.9 mc. A few months ago it was considered impossible to achieve the isolation between receiving and transmitting circuits necessary for translator operations within the amateur 2 meter band, but W6VMH and W6VKR, of the Project OSCAR Association, seem to have solved the problem.

On October 8, 1962 at 9:15 P.M. PDT, W6DKH and W6HEK had the first two-way QSO via the breadboard repeater, which was located at the QTH of W6VMH. Later, W6VMH joined for a 3-way QSO. Distances involved were of the order of 5 miles, and all signals were a.m. Tests of the repeater are now underway to determine its translation capability when a number of signals are within the passband of the equipment. It was planned to flight-test the translator from a high-flying airplane during early November. Test operation of the equipment, on the ground and in the air, has been approved by the F.C.C.

Encouraged by the success of the breadboard model, the OSCAR Association is now going full steam ahead to complete the design of what may become amateur radio's first repeater satellite. Discussions have already begun in Washington in preparation for an OSCAR III launch. It is still too early to report any firm results, but a mid-1963 launching is hoped for. There'll be lots more news of OSCAR III in this column, as the project progresses.

### OSCAR On Exhibit

A cut-away model of the OSCAR beacon satellite (actually a backup to OSCARs I and II) has been placed on exhibit in various parts of the world.

[*Continued on page 104*]

*11307 Clara St., Silver Spring, Md.

Making plans for OSCAR III's eventual launch in Washington recently are, from left-to-right, George Jacobs, W3ASK, ARRL President Herb. Hoover Jr., W6ZH, Edgar Martin, ex DL4UR, and John Huntoon, W1LVQ. OSCAR III will be a live repeater satellite, and it is hoped that it may be launched by mid-1963.

"Nick" Lassiter, OH2XZ, shown with the OSCAR demonstration satellite while it was on display during August at one of Helsinki's largest department stores. The exhibit, put on by the Finnish Radio Amateur League (SRAL), drew thousands of visitors, and made headline news in the press, radio and TV.

M.C. "Chuck" Towns, K6LFH, one of OSCAR's many fathers, shown holding a cut-away demonstration model of the beacon satellite which was placed on exhibit at the 1962 International Convention of the Institute Of Radio Engineers. The model has also been shown at several amateur radio exhibits in Canada, Finland and England.

sideband sideband sideband

# SIDEBAND

IRV & DOROTHY STRAUBER*, K2HEA/K2MGE

## SSB DX HONOR ROLL

| | | | |
|---|---|---|---|
| TI2HP | 276 | W6BAF | 237 |
| W8EAP | 272 | W2VCZ | 235 |
| VQ4ERR | 271 | W1OOS | 234 |
| W8PQQ | 271 | W8YBZ | 233 |
| W2ZX | 268 | W5IYU | 232 |
| HB9TL | 264 | W6RKP | 232 |
| PY4TK | 262 | W6WNE | 232 |
| W2FXN | 260 | G8KS | 231 |
| W6UOU | 260 | K1IXG | 230 |
| WØQVZ | 255 | G3NUG | 230 |
| K8RTW | 253 | WØUUV | 230 |
| K4TJL | 252 | I1AMU | 229 |
| W3NKM | 250 | DL1IN | 227 |
| K9EAB | 250 | W2TP | 227 |
| MP4BBW | 250 | K6ZXW | 226 |
| W4OPM | 250 | K1EJO | 226 |
| G3AWZ | 250 | G3FKM | 226 |
| W5AFX | 250 | WØCVU | 225 |
| K2MGE | 245 | G2BVN | 225 |
| W3MAC | 243 | W1AOL | 220 |
| W3LMA | 242 | UA3CR | 217 |
| W1LLF | 242 | K4PUS | 215 |
| PZ1AX | 240 | W2YBO | 214 |
| W6PXH | 239 | W1WDD | 214 |
| W2JXH | 237 | K6MLS | 210 |

## CQ SSB STICKERS AND CERTIFICATES

**Worked 275**

TI2HP

**Worked 250**

K4TJL K8RTW
G3AWZ W5AFX

**Worked 225**

G3NUG G2BVN
K6ZXW G3FKM
G8KS W1LLF
W2TP W8YBZ
K1EJO

**Worked 200**

K4AJ WA6HOH
WØBMQ OE1RZ
G3DO XE1AE

**Worked 175**

W1WDD W2PTM
WA6AMZ K1JMV
WØBMQ VE3BQP
G6LX XE1AE
G2PL DJ3CP

**Worked 150**

KØRDP W4RLS
W1WDD VE3BQP
K2ZKU W5KC
WA6AMZ K9MGF
WØBMQ W6USG
G3AIZ KP4AQQ

**Worked 125**

W1DD KP4CK
VP6WD W8CIQ
WØBMQ W9EYC
G3AIZ VE3BQP
KG6AJB K4HYL
W6USG W4PAA
KP4AQQ WA2EOQ
K4OEI W2MOF

**Worked 100**

GI6TK K4OEI
G3OGE KP4CK
K4HYL W4AXE
W6ZJY W5NTL
W2OWL UA2AO
ZS6AMV W6NWZ
LA5LG VK5QR
GI3CDF W9TKD
W4PAA

**Worked 75**

W2SNI K4RNS
G3OGE W4MVB
W1FJJ W5BVI
K3PQO W4EEE

**Worked 50**

ZS6YQ G3PEU
G3OGE W6KTE
WA2IWL G3GJQ
K6YVV

GI3CDF (80 meters only)
K2GXI (40 meters only)
W8JIN (40 meters only)

AN interesting point has been raised on the air as to what constitutes a valid signal report on s.s.b.; we hear, without official substantiation, that a 3 × 3 report is required for DXCC credit and we are curious to know if this same qualification should apply to sideband reports.

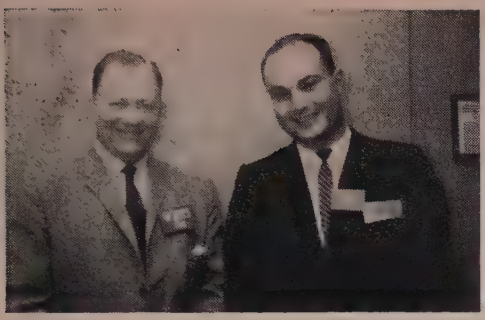
Can we have a contact on s.s.b. where the station can be copied with adequate readability when the strength of the r.f. signal is nil? Is a signal report of "3 × Ø" on s.s.b. a valid report? Are signal reports generally honest? Are S-meters trustworthy in a strict technical sense? Are criteria set for c.w. and a.m. valid for s.s.b.? Do we need a new set of standards for s.s.b. reporting?

Generally on c.w. and a.m. we are operating with a carrier which is interrupted by a key or modulated by our voice. We usually are more conscious of the carrier when tuning the signal and normally would make use of the S-meter to tune for maximum received strength. S.s.b. tuning concentrates on tuning for the naturalness of the received audio and S-meter readings are secondary in this process. In a great many instances, we tune in voices without being conscious of signal strength and, in some cases, there is no readable signal strength noticed on the S-meter. Try tuning a s.s.b. signal through heavy QRM and you will notice that the S-meter is not being effected by the received signal due to the interference registering fairly high readings on the meter. Yet you can copy the voice of the operator and carry on a satisfactory two-way contact. What situation?

Some time ago we had an interesting experience which further illustrates the difficulty of S-meter reports. Working a phone patch with a Canal Zone

*12 Elm St., Lynbrook, New York.

You've all heard of the big bottles used in finals. Wonder if the one that Phil Kahan, XE1FFF, of Mexico City is holding is responsible for the fine signal he puts out? *(Photo courtesy of W2WK)*



**Two well known sidebanders, Joe, W2MES, and Marv, W2FGD, are President and Vice President of the newly formed Long Island DX Association.**

station, the microphone was inadventantly switched "off" at the CZ station. After completing the patch, we were aware of a marked decrease in the received signal but we were able to make out the voice of the operator although the S-meter had fallen to the noise level of our receiver. By reason of a remarkably clear channel at that moment, we were able to copy the voice of the operator with little difficulty in spite of the soon-discovered "dead" mike! Here was the case of a received signal which was too weak to register on the S-meter; too weak to overcome the small amount of band noise present at the time. In fact, we doubt if the strength of the received signal was any stronger that the tube noise of the receiver! Signal report? Q-3 S-ø! Yet this was a two-way s.s.b. contact!

We realize that there must be some reference point for the exchange of reports and on c.w. and a.m. the carrier, which plays an important part of these types of operation, is a necessary part of the report exchange. We would question if the signal strength report on s.s.b. is at all necessary; there are too many occasions when there is no copyable signal strength although the audio is being copied without too much difficulty. Perhaps it is time to re-evaluate the system of signal reports and to include in a signal report on s.s.b. such things as audio readability, audio quality and signal quality.

Recently a DX station, VR3L/1, was handing out reports to the East Coast stations of Q-5 S-ø and had everyone in a tizzy over the validity of received cards for DXCC credit. Can anyone question that there was a valid two-way s.s.b. contact when a report of Q-5 was given even though, for reasons best known to the operator of the station, the signal strength was described as S-ø (by definition; faint signals-barely perceptible)?

For our part, we will accept as substantiated two-way s.s.b. contacts any report which gives a readability of Q-3 without regard to signal strength report although they should be included as part of the report.

We further suggest that a new system of sideband reporting should be initiated to include evaluation of received signals for quality and suppression; i.e.:

| | |
|---|---|
| Q-1 to 5—as before. | A-5—Excellent |
| S-5—Excellent Quality. | suppression. |
| S-4—Good Quality. | A-4—Good suppression. |
| S-3—Acceptable Quality. | A-3—Acceptable |
| S-2—Poor Quality. | suppression. |
| S-1—Very poor Quality. | A-2—Poor suppression. |
| | A-1—A.M. |

## More On 20 Meter Sideband

Two very important topics for general thought and discussion came up at the DX meeting of the combined ARRL National Convention and the Eighth Annual Pacific Northwest DX Convention in Portland, Oregon. It was suggested and overwhelmingly approved that "all 14 mc W/K s.s.b. stations operate from 14.200 up"-based on the following reasons. "The number of a.m. stations from 14.200 to 14.250 has been greatly decreasing in number, and there is a large void from 14.200 to 14.250. This decrease in a.m. with the rapidly growing number of s.s.b. stations makes this move eventually inevitable and practical *at this time.* These recommendations should be initiated immediately and a rapid and decisive move of s.s.b. stations to the low end of 20 meters should be started as soon as possible." It was also recommended that "DX phone stations operate below 14.200 kc and listen from 14.200 kc up" and that "an educational program should be started immediately to advise all DXers and DX stations of this suggestion."

(It must be noted at this point that this suggestion to move sideband operation to 14.200 was originally suggested by Larry Eisler, W3JTC, early in 1962.)

The second topic involved a "reward for merit system much like the old Class A system whereby phone operation on 14 mc and 75 meters be reserved for those showing improved abilities over a predetermined length of time since their original licensure. Privileges of present license holders would not be changed." Reasons given for this recommendation were that more suitable bands exist for the obvious beginner than 14 mc; more usage might be made of some of the lesser used bands; the rapidly increasing number of amateurs makes this imperative; and this system may give incentive to upgrade one's knowledge and abilities."

Let us examine the first topic—the move of sidebanders to 14.200. It must be clear to all that, in the relatively short time in which sideband has become popular, its adherents have rapidly overtaken and absorbed a majority of former a.m. users. It is equally apparent that the largest percentage of newcomers to phone are now using sideband. Logically then, with the current division between the sideband and a.m. portions, the lower end of 20 meters is rapidly being deserted as its operators move to sideband on the high end. Does it not seem foolish for half the band to be so crowded with sideband stations that they are tripping over each other while the lower half of the band is rapidly assuming the aspects of a "no-man's land"?

This matter of more frequencies for sideband has been kicked around for a long, long time. Now is the time for a cohesive force to rise up and consolidate the fraternity. We hope that, through this column, which has always striven to be of service to the sideband fraternity in particular and to amateur radio in general, the sidebanders will have the incentive to establish themselves at last.

On the second point—the "reward-for-merit system"—this is a plan that requires a great deal of discussion, a great deal of backing from everyone connected with the ham fraternity, a great deal of thought as to how the FCC could be pursuaded to take steps to upgrade the level of amateur radio in this country. *It is a worthwhile plan,*—worthy of any and all efforts to put

**Members of the Sideband Forum at the HARC Convention in New York City in October. L. to r. Bil Harrison, W2AVA of Harrison Radio; Chuck Carney, WØGDJ of Collins Radio; and Irv Binger, W2CMM of SSBARA.**

All we can say after seeing this photo of Felton Jenkins, KØZZR, in his shack in Minneapolis, Minn. is "WOW"!! Felton is the granddaddy we told you about several columns back who has a new lease on life, thanks to ham radio.

it into operation. Don't leave it to the other guy—give it some thought; talk it over with your friends; and let us hear what you come up with.

### First London SSB Dinner May 11

Sidebanders in the U.K. and in Europe, plus visitors from other parts of the world, will have a unique opportunity to meet each other when the first London SSB Dinner takes place on Saturday, May 11, at the Waldorf Hotel, Aldwych, W.C. 2, in London, England. Included in the admission price of 2 guinea (approx. $6) will be dinner, dancing and entertainment as well as a display of the newest in sideband equipment. Norman, G3FPK, will be pleased to accept reservations and/or answer any questions relating to this event. It is expected by the organizers that this first London Sideband Dinner will be so successful that it will become an annual event. Write at once to G3FPK for further details.

### News From Toronto

We received a most interesting letter from Bill Wragg, VE3BQP, which we'd like to share with you.

"Day in and day out, I spend 90% of my time listening. Consequently, I learn that the majority of hams now accept s.s.b. as inevitable and are working towards getting on the band-wagon. The old die-hards are getting fewer and fewer and are no longer a noisy majority. On the other hand, in both the East and the West, the s.s.b. boys are organizing the Clubs and providing the s.s.b. Dinners. In Ontario here, the annual s.s.b. Dinner in Toronto, November 10, has been pushed up to $5 a plate and already it is quite a trick to get a ticket.

"The Ontario DX Association is almost 100% s.s.b. It is definitely international in its outlook, scope and membership, counting quite a few well-known "foreign" s.s.b. DXers in its Associate Membership. VE3's—CIO and BWY,—Harry and Ham, have both traveled and operated s.s.b. rigs throughout North and South America this year, and, in so doing, have popularized s.s.b. in a way that would be hard to measure. And, in the same manner, the EX-G Club and Net have done much to further the cause of s.s.b. throughout the DX world. Well, so much for that.

"If 40 meter DX turns up trumps this year, a lot of the credit should go to Bob, VE3BWY, for his tireless missionary work making skeds with the DX boys in Brazil, Mexico, Africa, Australia and New Zealand, VR, and a few others."

(s) Bill Wragg, VE3BQP

It is with thanks to wonderful friends like Bill Wragg that we are able to keep you up to date with interesting developments in sideband throughout the world. Again, let us remind you that your correspondence is most welcome.

### SSB Forum At The HARC Convention

The Single Sideband Forum at the HARC Convention in New York City on October 13 attracted a standing-room-only group of interested amateurs. Moderated by *CQ*'s SIDEBAND Co-Editor, Irv Strauber, K2HEA, the panel consisted of Fritz Francke of Hallicrafters; Chuck Carney, WØGDJ of Collins Radio; Stuart Meyer, W2GHK Hammarlund Radio, Bil Harrison W2AVA of Harrison Radio and Irv Binger, W2CMM of the SSBARA. Getting off to a lively start, the panel members discussed such topics as S-meter readings, how to start in sideband, phone patching abuses, current sideband operating practices, and a host of other interesting topics. The audience participated through the use of written questions which were discussed by the panel. The two and a half hour time allotment was filled to the fullest and proved insufficient to completely and throughly cover the many topics of interest to the sideband fraternity.

### Sideband Around The World

Thanks go to Finn, LA6VC, for parting with a KWM-1 in order to initiate sideband activity from yet another new country. Finn loaned his tranceiver to LA9RG and LA1IH who will be in Svalbard (Spitzbergen) until next summer and who should now be active using /P after their calls on both s.s.b. and c.w. . . . Finally, at long last, we were able to re-establish contact with Claude, ex-FF8AK, who is now F9LC. Claude wrote that, after returning to France, he had to dispose of his s.s.b. equipment and is now on a.m. However, he plans to build a sideband rig which he hopes to finish by April, 1963 in order to chat once again with the many friends he made on sideband from Dakar. We hope to work with Claude in clearing up the QSL requests for his FF8AK activity; still on hand are the cards and s.a.s.e. we received last year so it is not necessary to make a further request. . . . Congratulations are in order to Bob, G3KGC and XYL, and to Peter, ZS6BBB and XYL, who welcomed a new son and daughter respectively during the summer. . . . Speaking of Peter, he and Les, ZS6PC, had been trying their best to get a ZS9 license for sideband activity from Bechuanaland. At this writing, their efforts had not yet proved fruitful but failing a ZS9 license, they were planning another DXpedition to ZS8-land. . . . Hopes are running high that Peter, VP8GQ, will put through a good signal on 160 meter s.s.b. while Martin, VR3O, has been giving the boys on 80 meter s.s.b. a wonderful time. . . . If you are interested in obtaining a card from HL9KR for the period from July, 1958 to February, 1959, write to Tom Williamson, ex-HL9KR, who is now K8HIB/VO1, PO Box 661, APO 864, New York, N.Y. Tom can only answer requests for contacts made during the above time span and be sure to include a s.a.s.e. for your reply. . . . W5PZG is the QSL manager for TG5WH which was a nice prefex to get on sideband. . . .

Wally, W9JJF, the "greatest DX operator in the world", will prove it all over again when his projected May DXpedition to Timor and Willis Island takes place. Joined by a top notch group of operators including VE7ZM, VK3WL, VE7ALE, and VK5AB, Wally is keeping his fingers crossed that this 15-day "dream DXpedition" goes through. . . . It's not "wedding bells breaking up that old gang of mine" but the necessity for new assignments that saw the EP2 sideband gang scattered all over the world. Buck, ex-EP2AG, is now K5ODC/4, 707 West Blount St., Pensacola, Fla.; Bill, EP2BB, was scheduled for Calcutta; while EP2BK was in Texas last we heard. . . . Humberto, T12HP, was elected Secretary General of the Federation of Central American Radio Clubs; we know that, under his direction, this group is going to be very successful.

It was delightful to welcome back Dup, ZS3DP, who was missing from sideband for some time. Dup was awaiting the arrival of a Drake 2B receiver which we know will make his sideband activities even more pleasurable. . . . Best wishes go to Art, ZS6AQQ, and family who moved from Klerksdorp to Johannesburg where Art is taking advanced courses in dentistry at the University. . . . Again congratulations are in order, this time to Dave, HH2P, ex-YN1TAT, who, withXYL Myrna, welcomed their child, a daughter Mary, during the summer. . . .

We are again grateful for this opportunity to wish our amateur friends everywhere a very Merry Christmas.

73, Irv and Dorothy

# YL

LOUISA B. SANDO*, W5RZJ

THESE Buckeye Belles are really on the ball! They have already announced definite date and place for the 25th Anniversary YLRL International Convention: **June 19-20-21, 1964, Lincoln Lodge, Columbus, Ohio.**

From brochures supplied by Publicity Chairman W8MBI, Marie, the Lincoln Lodge apears to be a superb spot for the convention. It is located two miles west of Columbus on U.S. Rt. 40, only 15 minutes from downtown. A suburban hotel with resort atmosphere, its air-conditioned rooms accommodate one to five persons and there are several dining rooms and coffee shop, plus banquet rooms, swiming pool, golf course, TV and recreation room, etc. Columbus is the state capitol and the home of Ohio State Univ., and has many other points of interest.

As mentioned earlier, chairman for the convention is K8MZT, Shirley Rex. Serving with her as co-chairman will be W8LGY, Ruth Rickett. Other chairmen appointed so far, besides P/C W8MBI, include: W8OTK, Alice, business mgr., and K8ITF, Marge, decorations & favors.

*4417 Eleventh St., N.W., Albuquerque, N.M.

### YLRL Appointees

YLRL president for '62, K6OQD, Jean, has appointed K1EKO, Edith McCracken, to be editor of

[*Continued on page 118*]

Top row photos. *Left:* On a recent flight from Calif. to Mo., Harryette, W6QGX, landed at Harper, Kansas, for a visit with KØGZO-GZN, and it soon became a small hamfest. At the airport to meet Harryette (center of picture) were KØGZO, Ginny (left), and Lois, WØYEF. W5's YSJ and RZJ also had an eyelash QSO with W6QGX at Albuquerque. *Center:* Members of the 40 meter YL Welcome Net who met in July for a picnic at the QTH of K8IOP, Vi, Flushing, Mich. L. to r., K8JXH, WN8ELE, W8VRH, K8OMH, K8LHF, W8ATB, WA8BRC, K8IOP. *Right:* 1964 YLRL Convention chairman Shirley, K8MZT (in doorway), and Buckeye Belles, l. to r., Louise (secy), K8HGD; Alice, W8OTK, (treas); and Marge, K8ITF (pres.), pictured at the Findlay, Ohio, hamfest in Sept. Shirley subsequently traveled in Canada and New England with her "Convention Headquarters" trailer. The 1964 Convention has been set for June 19-21 at Lincoln Lodge, Columbus, Ohio.

Bottom row photos. *Left:* At the National Convention at Portland, Bea Austin, W7HHH, received the cup awarded posthumously to her OM, Carl, W7GNJ, naming him honorary chairman of the Oregon ARA. A pioneer in radio, during WW II Carl instructed 200 students, most of whom went into the service in communications. Carl's name is the 25th engraved on the cup, the award being made annually by the OARA. *Center:* Honoring the State of New Jersey's crops of luscious tomatoes, the recently formed YL club chose the name "Jersey Tomater Radio Club." L. to r., front row: K2OTV, WA2QQW, K2AGI, WV2WOZ (age 12, jr. YL of WV2WOY). Back row: WA2PGR, Rose Hall (secy), Charlotte Mechanech, WV2ZOY (rec. secy), WV2QPB, Charlotte Cooper, K2OTW (pres.), WV2WOY, W2IQP (v.p. and YLRL's 2nd D/C), WA2QCE. Treasurer is WV2WPB. In addition to club meetings the first Mon. of every month at QTH of K2OTW, at net is held Mon. at 2200 on 146.5 mc. *Right:* Edith McCracken, K1EKO, *YLRL HARMONICS* editor for 1963.

# GOTHAM VERTICALS DELIVER THE CONTACTS

## THE ULTIMATE PROOF OF THE FINE PERFORMANCE OF THE GOTHAM VERTICAL ANTENNAS IS IN THE ACTUAL FIELD RESULTS, BY HAMS ALL OVER THE WORLD.

### PROVEN! PROVEN! BY THESE EXCERPTS FROM UNSOLICITED TESTIMONIALS:

**CASE HISTORY #71**

"I am very delighted with the first V80 and want another for a different location." A. C., California.

**CASE HISTORY #159**

"I ordered a Gotham V40 Vertical Antenna and found it so successful that several others are wanting them too. Will you please send me four more." W. A., Alaska.

**CASE HISTORY #248**

"I just wanted to let you know how pleased I am with my Gotham V80 antenna. I have worked a W.A.S. of 46/43, a WAC of 3/3, and DXCC of 14/12 in about 12 months." G. W., Maryland.

**CASE HISTORY #111**

"The V160 did a beautiful job on a VE1 for me. Also, I forgot to take it down during the hurricane of last week. It is just as straight as it was when I bought it." D. S., New Jersey.

**CASE HISTORY #250**

"I have one of your vertical antennas and have been having fine results on 10, 15, and 20 meters." N. S. P., Missouri.

**CASE HISTORY #613**

"I have never been happier with any antenna than I have been with the V80. I have worked all bands with it and have had tremendous success—i.e., DL4s, ZS3, etc., all solid copy." R. D. S., Penna.

**CASE HISTORY #483**

"My V80 is working wonders. I am able to maintain a 1:1 SWR all across the 40 meter band. After many years on 10, 15, and 20, the XYL and I are getting great kicks out of some oft he lower bands." J. A., New Mexico.

**CASE HISTORY #123**

"I am full of praise for your vertical. In the recent field day, we went up to the mountains near here and QSO'd a KA2, KZ5, and an XE at 2100 PDST on 15 meters. We got a 59 plus from the KA and KZ and 58 from the XE." D. P., Nevada.

**CASE HISTORY #398**

"Some months ago I purchased one of your V80 vertical antennas. I have had wonderful results with this antenna, and I think it was of far greater value than the small amount I paid for it." R. C., Utah.

**CASE HISTORY #766**

"The Gotham vertical takes almost no room. I don't see how I could have used any other type very well. Sure do appreciate the fine record this antenna has made so far." H. C., Haiti.

### DO YOU KNOW

1. YOU WILL HAVE NO DIFFICULTY INSTALLING YOUR GOTHAM VERTICAL ANTENNA IN JUST A FEW MOMENTS, REGARDLESS OF YOUR PARTICULAR PROBLEM, SO ORDER WITH CONFIDENCE EVEN IF YOU HAVE RESTRICTED SPACE OR A DIFFICULT SITUATION.
2. LOADING COIL NOT REQUIRED ON 6, 10, 15 AND 20 METERS. FOR 40, 80, AND 160 METERS, LOADING COIL TAPS ARE CHANGED MANUALLY EXCEPT IF A WIDE-RANGE PI-NETWORK OUTPUT OR AN ANTENNA TUNER IS USED; IN THIS CASE BAND CHANGING CAN BE DONE FROM THE SHACK.
3. EVERY GOTHAM ANTENNA IS SOLD ON A TEN DAY TRIAL BASIS. IF YOU ARE NOT FULLY SATISFIED, YOU MAY RETURN THE ANTENNA PREPAID FOR FULL REFUND OF THE PURCHASE PRICE. THIS IS YOUR GUARANTEE OF FULL SATISFACTION.

## FILL IN AND SEND TODAY!

***Airmail Order Today—We Ship Tomorrow***

**GOTHAM** Dept. CQ
**1805-A PURDY AVE., MIAMI BEACH, FLA.**

Enclosed find check or money-order for:

☐ V40 VERTICAL ANTENNA FOR 40, 20, 15, 10 AND 6 METER BANDS. ESPECIALLY SUITED FOR THE HAM WHO OPERATES 40 AND 15 ..... $14.95

☐ V80 VERTICAL ANTENNA FOR 80, 40, 20, 15, 10 AND 6 METER BANDS. MOST POPULAR OF THE VERTICALS. USED BY THOUSANDS OF NOVICES, TECHNICIANS, AND GENERAL LICENSE HAMS ..... $16.95

☐ V160 VERTICAL ANTENNA FOR 160, 80, 40, 20, 15, 10 AND 6 METER BANDS. SAME AS THE OTHER VERTICAL ANTENNAS, EXCEPT THAT A LARGER LOADING COIL PERMITS OPERATION ON THE 160 METER BAND ALSO $18.95

**HOW TO ORDER.** Send check or money order directly to Gotham. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

Name_____

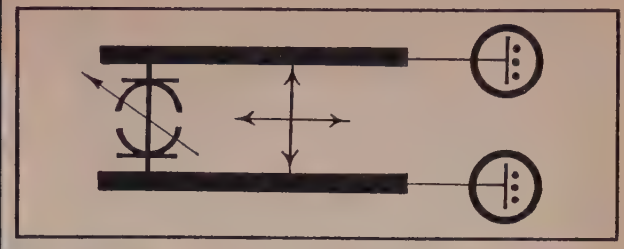
Address_____

City_____ Zone____ State_____

For further information, check number 34, on page 128

Vol. 4, No. 12—December 1962

# VHF AMATEUR



# In This Issue

## FEATURES


Medium Power on 6—Economically
*Irwin Math, WA2NDM* 85

Those Auto Connectors
*Harvey Hurwitz, WA2HYS* 87

Eliminate Overload!
*Dave L. Heller, K3HNP* 88

You Can Help ..... *Bob Brown, K2ZSQ* 89

A Mobile Call Letter Plaque
*Carl A. Schultz, WA2IMG* 90

Commercial Commotion
*Roger Crawford, WA6PU* 91

APX-6 Radiators ..... *Allen Katz, K2UYH* 91

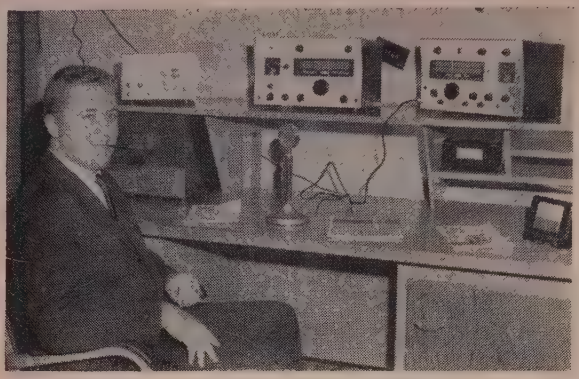
VHF Balun ..... *Irwin Math, WA2NDM* 98


## DEPARTMENTS


| | | | |
|---|---|---|---|
| VHF SSB ..... | 92 | DX Report ..... | 96 |
| UHF ..... | 93 | In The Works ..... | 100 |
| Answerman ..... | 94 | Report Form ..... | 100 |


## STAFF


**Editor** ..... **Robert M. Brown, K2ZSQ**
VHF SSB ..... Robert Heil, K9EID
UHF ..... Allen Katz, K2UYH
Answerman ..... Ken Phillips, K8CHE
DX Report ..... D. Parnes, WA2DMQ; R. Brown, K2ZSQ
**The VHF Amateur, 300 W. 43rd St., New York 36, N. Y.**



## Best Deal on CLEGG—vhf

**Florida's BIG 6 and 2 meter signals and fantastic trade in deals come to you from Phil LaMarche, W9DVM, manager of our new Orlando Florida Store!**

Here is a picture of our man in Florida . . . Phil LaMarche, W9DVM/4. The picture shows Phil with the Clegg "Interceptor" Receiver and the terrific "Zeus" Transmitter . . . at the demonstration desk of Amateur Electronic Supply's new Orlando, Florida store, 23 Azalea Park Shopping Center. Telephone number is 277-8231. Phil is all set up to meet and work with all our Florida ham friends. Come in and personally get acquainted with the big signals that Clegg VHF gear delivers. Phil says, "In addition to the big signal I get from the Zeus Transmitter, I find Clegg gear is remarkably trouble free . . . thanks to the good design and the care they take in production. The only trouble I have with Clegg gear is trying to keep enough of it in stock! If you can't come in, order by mail directly from our Milwaukee store where we're set up to handle all our mail orders and ham correspondence.

## $5.00 DOWN ...UP TO 3 YEARS TO PAY

### ...DELIVERS ANY NEW CLEGG VHF GEAR TO YOU!

### ...and look at these low monthly payments after just a $5 down payment:

| | Amateur Net Price | Payments per month for 1 year | 2 years | 3 years |
|---|---|---|---|---|
| Clegg Zeus | $695.00 | $63.25 | $34.50 | $24.91 |
| Clegg Interceptor | 473.00 | 42.83 | 23.33 | 17.91 |
| Clegg 99'er Transceiver | 159.00 | 14.11 | 7.70 | 5.56 |
| THOR IV, 6 meter, 50 Watt Transceiver Tentative Price | 350.00 | 31.62 | 17.25 | 12.45 |
| VENUS, 6 meter, SSB Rig, Tentative Price | 425.00 | 38.50 | 21.00 | 15.16 |

**STAY ON THE AIR PLAN!**

No need to go off the air. Keep the gear you're trading in until your New Clegg equipment arrives!

**CREDIT AND ORDERING INFORMATION...**

See our special ad on page 108. The information in this ad will help us ship your order at once. Fill out complete and enclose with your $5 deposit.

**AMATEUR ELECTRONIC SUPPLY**

**THREE STORES TO SERVE YOU**

**Please send mail orders to Milwaukee Store**
3832 West Lisbon Ave., Milwaukee 8, Wis. • PHONE WEST 3-3262

**CHICAGO 31, ILL.**
6450 Milwaukee Ave.,
PHONE RO 3-1030

**ORLANDO, FLORIDA**
23 Azalea Park
Shopping Center

Amateur Electronic Supply—Mail Order Dept. L-12
3832 W. Lisbon Ave., Milwaukee 8, Wisc.

Ship me .....

I enclose.....; I will pay the balance

☐ 1 year ☐ 2 years ☐ 3 years

If new account—enclose credit information—see page for details

I want to buy..... and want to tr

..... What's your de

Name.....

Address .....

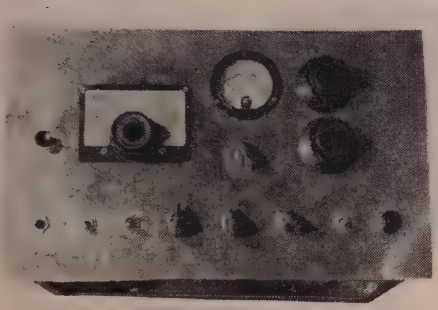
City ..... State .....

Send reconditioned equipment bulletin

For further information, check number 40, on page 128

# Medium Power on 6 - Economically

IRWIN MATH, WA2NDM
36 Wilcox Avenue
Yonkers, New York



**Front panel view of 50 mc transmitter. Left to right: mike jack, power switch, transmit/receive, audio gain, excitation, drive, tune/operate, pilot light. Top controls: spot button, meter, plate and coupling.**

MEDIUM power on 6 meters (100-200 watts) is usually fairly expensive to obtain. By careful utilization of surplus government components however, and parts from an old TV set, a good VFO controlled transmitter can be built for a very reasonable cost. In fact, the transmitter described here was built for a total cost of less than 50 dollars. The better the junk box, the lower the cost.

The 6 meter transmitter is a plate modulated affair running about 120 watts input on phone. Provision was not made for c.w. operation, but can easily be added. A 7 pin socket for a 6AQ5 clamp tube was added for this purpose. The VFO employs a 6AG7 pentode in a stable series tuned Colpitts oscillator. This circuit can be varied over about 300 kc before it becomes necessary to re-resonate the plate circuit to obtain more drive to the next stage. The oscillator plate circuit is tuned to the third harmonic of the basic frequency. The 25 to 27 mc output is fed to a 1614 doubler which develops more than enough drive for a pair of 6146's. The output of the 6146 stage is coupled to the antenna by means of a tunable link.

The modulator employs a 12AX7 speech amplifier, which in turn drives a 12J5 which is coupled to a pair of 1625's in push-pull. The 1625's, through an ARC-5 modulation

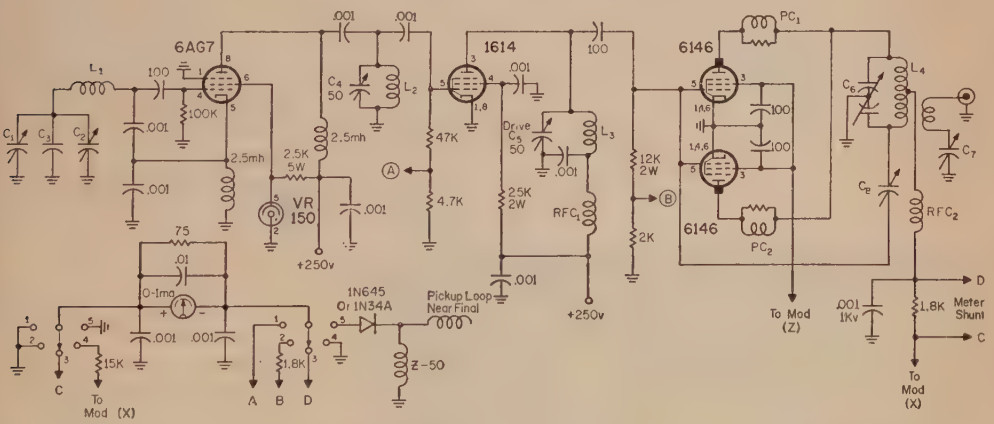
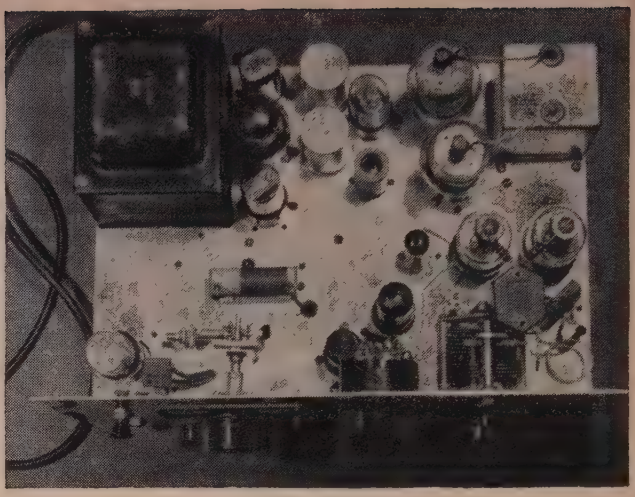



**Fig. 1.—R.f. section of WA2NDM's medium power 50 mc v.f.o. controlled transmitter.**

$C_1$—27 mmf miniature variable.
$C_2$—15 mmf miniature variable.
$C_3$—10 mmf ceramic capacitor (silver mica).
$C_4$, $C_5$—50 mmf variable.
$C_6$—25 mmf dual section variable (a butterfly may be used).
$C_7$—100 mmf variable.
$C_8$—1 to 15 mmf variable (APC 25 mmf trimmer with 2 rotor plates).
$L_1$—36 t. #20 e. 1" dia. 1" long.
$L_3$—12 t. #20 tinned copper wire, 1" dia.
$L_2$—4 t. #20 tinned copper wire, 1" dia.
$L_4$—12 t. #14, 1" dia. 1½" long c.t. with 2 t. link wound over center.
$PC_{1, 2}$—3 t. #20 e. on 47 ohm 1 watt resistor.
$RFC_1$—Z-50 choke.
$RFC_2$—42 t. #24 on ¼" dia. ceramic form.
Meter shunt—handmade to enable meter used to have a 400 ma full scale reading.



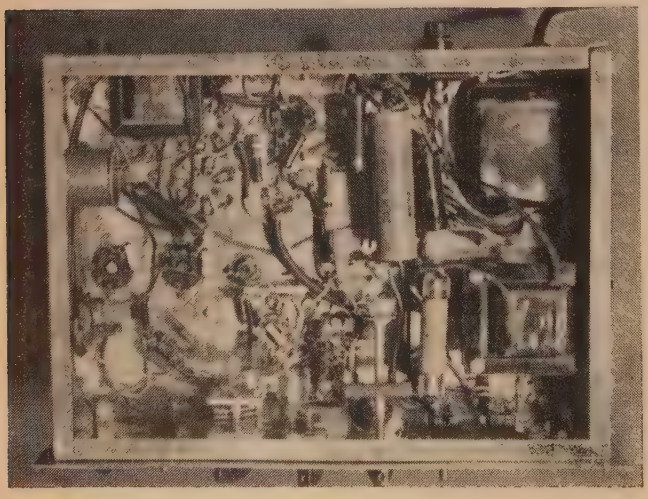
**Top view of transmitter. The v.f.o. is in the lower left corner with the VR-150. Proceeding to the right we find the 6AG7, 1614, 6AQ5 and the 6146's. Above from right to left, 1625's, 12J5, 12AX7, 5U4 and two 6DE4's.**

transformer, plate and screen modulates the final fully. The power supply consists of a full-wave bridge employing an RCA 630 type TV set power transformer. The two 6DE4's are the only new components (aside from the enclosure) in the entire transmitter.

The transmitter is built on a 10 × 14 × 3" aluminum chassis, to which is attached a 17 × 9 × ⅛" aluminum front panel to fit the enclosure. Different enclosures will require different front panels. Component layout can easily be seen in the pictures. The power supply choke is mounted below the audio gain control, which is on a small steel bracket especially made for the purpose. The power supply should be wired first, employing heavy gauge insulated hookup wire. Next the modulator is wired, and finally the r.f. portion. Be sure to keep all leads in the r.f. section as short as possible to obtain good stability and reduce parasitics to an obsolute minimum. When wiring the v.f.o., make sure all components are mounted as rigidly as possible, especially the v.f.o. coil and capacitors. This coil was wound on a ceramic coil form that was salvaged from an old BC-620. After winding, it was given five heavy coats of plastic spray, with the result that a high $Q$, mechanically stable coil was produced.

All tubes (except for the 6DE4's), the modulation transformer, and all variable capacitors, as well as the numerous resistors and capacitors were obtained from the surplus market. The power transformer, tube sockets, and electrolytics etc. were obtained from a junked RCA 630 TV set which was obtained for $3.00 from the local TV shop. Of course, all components were checked before using. I would recommend doing this, because two resistors were found that were far from their rated value. The complete schematic diagram is shown in fig. 4.

After construction is complete, the range of the v.f.o. should be adjusted with a grid dip



**Bottom view of chassis. R.f. section is to the left, modulator section in the upper center, and power supply on the far right. The larger transformer (upper right hand corner) is the main power transformer, while the smaller one in the upper left corner is modulation.**

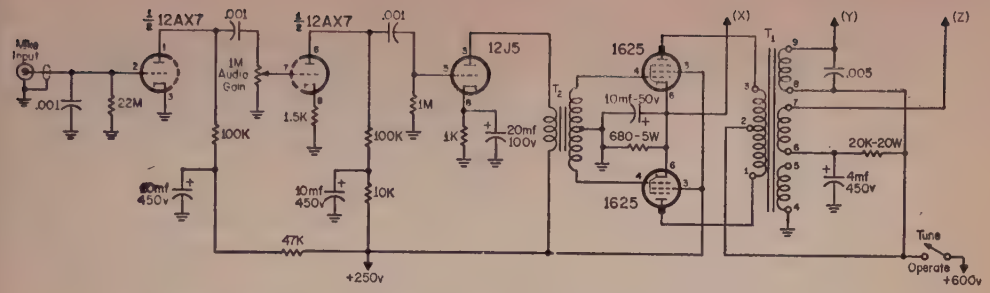



**Fig. 2—Schematic diagram of the modulator and speech amplifier using 1625's.**

**$T_1$—Modulation transformer from MD-7/ARC-5 modulator.**

**$T_2$—Driver transformer, single plate to push-pull grids.**

meter to cover 8.33 to 9 mc. Once the transmitter is on air, final exact calibration can be done with the station receiver. Drive to the 1614 should be adjusted for maximum which will be 1-2 ma. 6146 grid current will be about 4-5 ma for best operation. Maximum plate current should be in the neighborhood of 200 ma. with 600 volts B+. A 25% increase in modulator current indicates about 90 to 95% modulation. The amplifier should now be neutralized, the procedure for which is well described in the *Radio Amateurs Handbook*. A 100 watt lamp, with a 50 mmf trimmer in series, will glow brightly when connected to the transmitter r.f. connector. Modulation will cause a noticeable flicker of the bulb. The transmitter can now be loaded to your favorite antenna and you are on six meters, v.f.o. controlled, and with a good healthy signal. ■

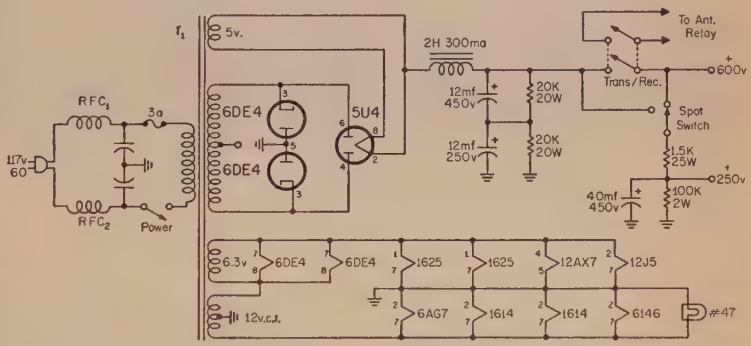



**Fig. 3—Power supply for r.f. and modulator/speech amplifier circuits showing switch section for antenna relay control.**

**$RFC_1$, $RFC_2$—8 t. #20 e. on 1 meg, 1 watt resistor. $T_1$—Power transformer: RCA 680 TV set, 1000v c.t. @ 5a, 5v @ 10a, and 6.3v @ 3a.**

# Those Auto Connectors...

HARVEY HURWITZ, WA2HYS
3451 Third Street
Oceanside, New York

FOR many years one of the so-called "annoyances" in the field of v.h.f. radio has been the use of Motorola auto-type connectors on converters and similar add-on devices. It had been felt that these plugs and jacks were only suitable for broadcast band operation and that they were out of place in v.h.f. It is quite interesting to note that in some cases these connectors exhibit many more attractive features for the v.h.f. man then they do for broadcast use. The use of threaded connectors (or bayonet type has) always provided for a quick and readily detachable connection. The only inherant problem is that these connectors often detach themselves when least desired due to vibration or mechanical shock. This is not a problem with the Motorola unit. Once installed in its socket

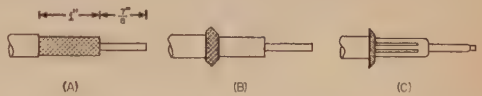



**Fig. 1—Simple diagram showing how to solder coaxial cable into a Motorola type fitting. Strip covering back about 1⅞" (A). Then push back the braid into a bead (B). Insert the plug until the bead touches the plug shell and solder the braid to the plug tabs. Solder the center conductor and cut-off any excess wire (C).**

it will remain secure regardless of the vibration loads imposed. Mounting of the Motorola plug on a cable is quite simple and the resultant joint is both mechanically and electrically rigid. Losses in the connector itself are virtually nill up to and somewhat beyond 220 mc. ■

# Eliminate Overload!

DAVID L. HELLER, K3HNP
14 Darkleaf Lane
Levittown, Pennsylvania

*Cross modulation or "overload" has long plagued v.h.f. converters to the utter dismay of the weak-signal DX men. Here are hints and tips on reducing the situation in your present receiving setup, plus a simple 50 mc tunable cavity preamplifier for truly effective results.*

A MAJOR problem facing v.h.f. operators is overloaded receivers. This problem is analogous to the common TVI overload, and has three solutions: a line filter to attenuate the troublesome signal, or overload-resistant circuitry.

Input filtering may be fixed tuned, or variable: high, or low bandpass. The fixed tuned filter suffices for commercial stations giving trouble, such as a nearby Channel 2 on 6 meters. This type of trap may take various forms; either the Gavin *Maverick* type filter[1] or the Clegg filter[2] will do the job well in the common antenna line. Both are designed to handle transmitter power.

Several excellent converters, such as the Tapetone 201, have been offered and described recently.[3] These converters, often using nuvistor front ends, have produced various results, but in many instances they have eliminated overload to the point of permitting duplex operation on frequencies only 200 kc apart.

There are numerous theories about where the cross modulation which constitutes overload occurs. Basically, cross modulation can occur in any stage where the signal permits non-linear grid operation. Avoidance is not too difficult—just keep the signal level low enough so that the non-linear situation doesn't occur with any normally received signal. No harm can result, as the i.f. strip inevitably is a communications receiver responsive to one microvolt input. A converter with prior gain of 30 db will induce response to .001 microvolt, if

[1]Daskam, *The VHF Amateur*, June 1961.
[2]Clegg Laboratories, Mt. Tabor, New Jersey (new release).
[3]Harris, *QST*, July 1961.

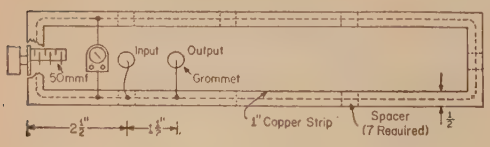
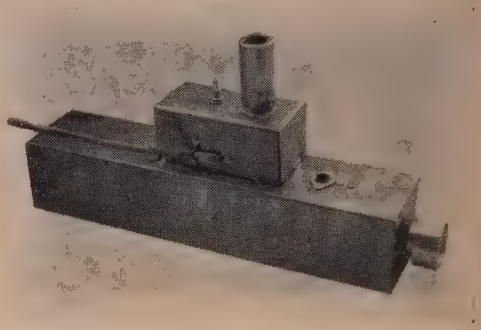



Fig. 1—Bottom view of resonator showing placement of essential components.



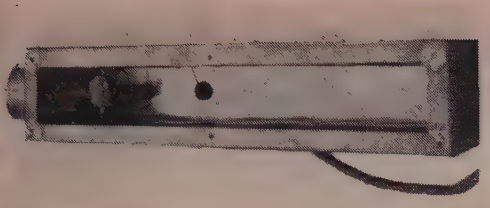
View of K3HNP's compact tunable cavity preamplifier for 50 mc overload problems. Tube used here is a 417A, but a 6CW4 or 6DS4 nuvistor can also be used with the same results.

true, greatly simplifying moon bounce work. But a .5 volt signal (40 db over S9) on a highly sensitive r.f. stage is a natural for cross-modulation.

Part of the answer, therefore, is to keep gain low. How low is dependent on the overall system. Have as much gain as can be used, and no more.[4,5,6] If a signal indicates S9 when the no-signal background is S7, the report is S2. If the signal is S5 and the background is S2, the report is S3—twice as much. So use the S meter properly, as a comparison device. Set the receiver, antenna shorted, to show S1. Attach the converter, input shorted. The converter noise should add almost an S unit. Now attach the antenna. Antenna noise should register, giving a total S3 reading or less. If, as at my location, the S meter goes up to between 5 and 9 or higher, try 40 phone, where you'll never hear the noise for Radio Moscow.

But if the increment without ant. is more than a couple db (just enough to show things are working) there's excess and unusable gain. If attaching the converter, input shorted, makes an appreciable increase in receiver noise, reduce the gain by biasing the converter tubes (if they'll respond) and by inserting an attenu-

[4]Harris, *QST*, February 1961.
[5]Tilton, *QST*, October 1961.
[6]Heller, *The VHF Amateur*, October 1961.



Underside view of the resonator. Lines run parallel with chassis edge along the entire length of the box (barely visible here). Dark section at the far left contains the variable capacitor and trimmer.

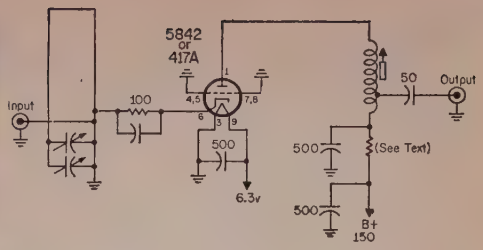



Fig. 2 Schematic diagram of the resonator and preamplifier.

ator *after* the mixer. The converter input is the lowest level point in the chain, and thus is the last place overload can occur. In a properly designed converter the r.f. gain is optimized; it is sufficient to mask inherent converter noise, without excess. Thus the r.f. stage gain, once correct, is best left alone.

Converter gain is low? Mixers should be adjusted for proper conversion action. Mixer overload is of course possible, but generally the mixer level is still low enough to be free of trouble, assuming there is no excess gain in preceding r.f. stages.

The likely place to have cross modulation is the receiver input. And, since using the criteria above, converter gain is usually excessive, any attenuation could be in the connection between the converter and receiver. A resistor-attenuation network will suffice. T-pad design data is in many ARRL *Handbooks*.[7] The converter and receiver design impedances should be matched as well as possible to minimize i.f. feedthrough.

### Tunable 50 mc Cavity Preamplifier

While I was visiting W1FCP and operating his 6 meter rig (talking to a station several hundred miles away on groundwave) a really close local came on and blanketed the band. I reached for the big switch, but Charlie guided my hand to a knob under the desk. I turned it—the cross modulation disappeared. Immediately I knew that this was for me. Now with the assistance from W1FCP, the compact cavity filter is published.

The filter is exceedingly simple. A resonant line with capacity loading couples the antenna to a grounded grid triode. The broad tuned output can be tapped to match the converter's input.

The filter is built on two chassis: the amplifier is on a 4 × 2⅛ × 2⅝″ box; the resonator, in a 12 × 2¼ × 2½″ box. These are odd sized chassis (mine were bent from 020 brass) but Bud miniboxes CU-3002 and CU-3014 match these dimensions exactly and could be altered to match the construction.

The diagrams tell the story. The resonator is constructed inside the larger box from a strip of 1″ wide copper. Any high grade insulators will do for the ½″ spacers; the one shown is a suggestion. Mount the padder capacitor on an insulating block also (Lucite works well here, too).

Adjust the padder so the resonator dips to about 48 mc with the cover off; when the box is closed up, resonance will be about 50 mc. The output coil should be tuned to about 50 mc and touched up on a signal for best output. Some adjustment of the taps on the resonator may be required for best results.

There is no reason why a 6CW4 nuvistor couldn't perform as well as the 417A at much less cost and power requirements. The tube's function is not to provide overall gain, but to counteract any losses in the resonator when it is off peak. In operation the resonator can be tuned either for maximum signal or for optimum rejection of an overloading signal. It will not separate several QRM'ing signals, but it will effectively attuate an overloading signal without excessive effect on the desired station. This resonator is not the equal of a well designed overload-resistant converter in most situations. It performs a specific function, and is described for that purpose. ■

[7]Federal Telephone and Radio Corporation, *Reference Data for Radio Engineers* (any edition)

# You Can Help!

Most magazine columns are based on the author's own writings, news he picks up over the air, and the letters he receives from readers. In this respect, *The VHF Amateur's* UHF Column and our DX Report are different. Both columns are evolved around our monthly Reader's Reporting Form. This form (page 100), when properly filled out with your entries, presents to us an abbreviated insight on the activities of your station. We urge you to participate in this venture and contribute your Report on a regular basis.

In addition to the short rip-out form on page 100, we have available separate standard size DX Report and UHF Column Reader Reporting Forms. Please send self-addressed-stamped envelope for your supply. These are bigger and have more space for your entries—*K2ZSQ*.

# A Mobile Call Letter Plaque

CARL A. SCHULTZ, WA2IMG
32 Sky View Drive
Cohoes, New York

HAVE you ever been on the road and beeped a friendly HI to a passing ham, only to find that he doesn't have the foggiest notion who you are? This simply constructed vertical plaque can be mounted right on the halo masting section and can be seen for several hundred feet. Before I go into the details, however, a quick note to the thrifty: total cost is under three dollars.

## Construction

Materials needed are: two U bolts with mast clamps, one sheet of plexiglass (or masonite) cut to the proper size, and your call in 3" decals (available as boat letters from A-Z). All of the above parts are available at your local hardware or paint store. Time? If you're an average do-it-yourselfer, about 20 minutes.

Start by cutting your piece of plexiglass or masonite to the proper size. For K or W calls, 16 × 3¾". For WA, WV, or WB calls, 20 × 3¾". Plexiglass comes with a protective cover. Do not remove this until cutting is complete. If masonite is used, paint it with a desired color and let dry before proceeding. Plexiglass *does not* require paint.

Now fill a tray (an ice cube tray is good if the XYL isn't looking) with warm—*not hot*—water. Remove the decals from the envelopes in which they come, and place them in the warm water to let them soak and become transferable. Before applying them from the backing to the board, make sure the surface of the board is clean and free of fingermarks. Now proceed to apply the letters from top to bottom. Take a cloth and press on each decal after they are on the surface. This will absorb the excess water and push any air bubbles out from under the decal. Make sure they are straight. When they have all been put on, allow about 5 minutes for drying.

Proceed by applying a coat of *clear* varnish over the whole side of the board that the decals are on. Again, allow time for drying.

While the varnish is drying, take the two U-bolts, and remove the nuts and clamps. Cut off the ends of the U-bolts. Remove only 1¾" of the threaded part of the bolt.

Now break out a ¼" drill and your pencil. Take the board and between the first two decals and the last two decals mark off two spots where the ends of the U-bolts will pass through the board without going through the decals. Drill through these marked areas. If you use plexiglass, *do not* use an electric drill as it will split the board. To avoid the splitting the plexiglass, place a piece of masking tape over the mark before you drill (if you do not have a hand drill).

Now your plaque is ready to mount on the antenna masting. Reverse the clamps before you put the board on the U-bolts. Avoid tightening the clamps too much, else you crack the plexiglass. (Masonite will bend first, but too much pressure here will also crack the material).

Let me hear from you. Perhaps you have similar ideas on call letter mobile mountings which could be incorporated into a possible future write-up. ■

Commentary:

# Commercial Commotion

ROGER CRAWFORD, WA6PU

THERE'S so much talk about the commercial bands running out of frequencies. I frankly don't understand it. Granted that there are more and more applicants for commercial allocations, and each one is "entitled" to a clear channel in his service area. But let's look at what's available.

I've gone through Volume V of the FCC *Rules* and here's some of what I've found . . . First, authorized bandwidths for commercial stations (9.181):

| | | |
|---|---|---|
| A1 | (c.w.) | 0.25 kc |
| A2 | (m.c.w.) | 2.754 kc |
| A3 | (a.m.) | 8.0 kc |
| A3a | (s.s.b.) | 4.0 kc |
| F1 | (n.b.f.m.) | 2.5 kc below 50 mc. |

Above 50 mc a.m. and m.c.w. are permitted to use 50 kc!

A "buffer zone" is nice for commercial use, just as it is for hams, but how wide must it be? Fifteen, 20, 50 kc between stations? If our 6 meter band were given to commercial stations, it could accommodate all of 80 stations, of which only six would fit between 50.1 and 50.4! The reason for all this space is to "avoid interference." Heathkit Sixers could operate this way with no trouble; but commercials don't use superregenerative receivers. They use stable multi-conversion superhets, usually crystal-controlled, and are priced at or above the highest amateur levels. If with comparative junk (free-running oscillators in both transmitter and receiver) I can operate on 6 meters with locals 15 kc either side of me, the commercial stations could easily do the same with their improved equipment.

How about s.s.b. for commercials? It is only sparingly used so far. For fixed frequency use, sideband receivers and transmitters are tremendously simplified. Operational tuning doesn't exist; stable v.f.o.'s such as we use are no problem since everything is crystal controlled, set and forgotten.

Frequencies are allocated to avoid co-channel interference. When bands are closed, skip interference is no problem. The Commission tries to space stations sharing a frequency just beyond the groundwave limit but too close for sporadic-*E*. They're usually successful. Of course above 100 mc skip problems fade away.

Before making too much fuss about running out of frequencies why not:

1. Space frequency allocations as close together as the state of the art permits?
2. Use sideband? ■

# APX-6 RADIATORS

ALLEN KATZ, K2UYH, STAFF

MANY of the fellows are converting their APX-6 transmitters (which usually tune only up to 1220 mc) to cover the entire 1296 mc band. One easy method of accomplishing this conversion is to place ¼" sleeve (which can be salvaged from the APX-6's unused pulse modulator) around the six screws which hold the cavities to the chassis where the tuning drive gears are located. The antenna connector hole on the front panel will have to be elongated a ¼" toward the APX-6's top, since the cavities will sit a ¼" higher on their chassis. The only other modification is to cut a feedback loop for the particular part of the band you wish to operate. The feedback loop length for 1296 mc is approximately 6½".

The most popular 1220 mc antenna seems to be the corner reflector. This antenna consists of two 20" squares of aluminum flashing coming together at an angle of 60°. Its feed is made from a 10" length of ⅜" copper tubing into which is placed the end of the RG-8U cable (which will be used to feed the antenna) stripped of its outer braid. The RG-8U's copper braid is then soldered to the end of the copper tube. At the other end of the copper tube a half wave dipole is soldered. One side of the dipole (2½" of #12 copper wire) is soldered to the coax's center conductor, while the other side of the dipole is soldered to the copper tube. A 2½" length of ¾" diameter copper is slid over the ⅜" copper tube to make a matching transformer (see figure 1).

U.S. 1 Electronics, E. Edgar Road, Linden, N. J., has a few APX-6 transponders at this writing going for $20.00 f.o.b. Linden, N.J. Write for further information.

Looking for the HM connector that the APX-6 antenna jack takes? Veterans Salvage Co. at 78-21st Avenue, Paterson, New Jersey, has new surplus HM connectors for only 90¢. This price is quite a savings over the regular price. ■

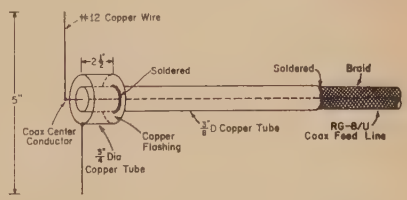



**Fig. 1—Corner Reflector Feeder.**

# VHF SSB

ROBERT HEIL*, K9EID

It is that time once again. Every year we are faced with the familiar battle of the new equipment line up. This year is definitely no exception.

In the past we have been introduced to the many new a.m. transmitters and receivers. This season it looks as if it is starting a new trend. It seems the manufacturers are forgetting the accent on their a.m. gear and have their designers working on new single sideband equipment. So much the better! Now the never ending tug of war for the market will start all over again with new sideband equipment. Each of the various manufacturers is trying to give the amateur more bands and better performance for less money than their competitor.

The parade of equipment this year brings us in contact with many new transceivers with a very modest price tag. This will be an excellent chance for the v.h.f. operators, some of whom have always contended that sideband is too expensive to get a signal (minus the carrier) on the air without flattening the honorable pocketbook. With the addition of a simple mixer to one of the inexpensive transceivers, you have a complete station ready to go.

## Two Meter SSB

A large Gain, Inc. "J" antenna has been erected here on the big tower and is giving fantastic results. The antenna consists of four 8 element beams stacked one over the other at 110'. The big 32 is one of the finest antennas available for two meter extended distance work, yet it only weighs 30 pounds! Take a look at the specs. WØLFE, WØDDX, WØLLU, and W9RNM have all erected the eight over eight "J" antennas and have unbelievable signals on two meters.

## WØDDX

Regular schedules have been maintained between WØDDX and yours truly recently. This is a 300 mile two meter path and the signals seem to hold up amazingly well. We have been able to maintain contact each day for well over 30 minutes. Roscoe, WØDDX, has a good solid sideband signal with his Collins 32S-1 driving a homebrew mixer built from an ARC transmitter. His final amplifier is the Johnson 6N2 Thunderbolt. Roscoe has the eight over eight "J" beam and is getting things ready to erect another set to bring him up to 32 elements. The receiving system consists of a Collins 75A2 and a 75S1 ahead of a nuvistor converter. WØDDX usually can be found around 144.9 through 145. 5 mc as well as the extreme low end of the band.

## Two Way SSB Frequency

This brings up another subject for meditation or the nightly rag chew. Many two meter sidebanders are looking for other "way out" sideband operators, but a common sideband frequency has been a big problem. As of this date, no certain sideband calling frequency has been established; it would seem to be very convenient to tune 100 or 200 kc of the two meter band and hear all the sideband stations there.

*402 Border Street, Marissa, Illinois.

**Ellis, K9SDA, from Alton, Illinois, poses for the *VHF* camera.**

Drop me a line and let me hear your ideas on the subject.

## Operating News—144 mc

Over on the other side of the Muddy Mississippi stands W9WQS in Lafayette, Indiana. Rex puts out a nice clean sideband signal on 2 and 6 meter with the pair of P&H transverters being driven with the 20A. He listens on a Clegg Interceptor. Be sure to listen for Rex!

Not too far from Rex is Art, W9POS, who resides in Terre Haute, Ind. Art has a homebrew crystal filter exciter with a pair of 6146's in the final. This is an extremely effective system on two sideband.

Tiny, K9KYZ, at Middleton, Illinois, has a new P&H 2-150 on the air and can always be found ready to have a session on two-way sideband. He can usually be found talking to the gang on or about 144.350 mc. Whitey, W9KQX, at Springfield, Illinois, has a little 5 watt homebrew sideband rig with a 6360 final which does very well for him. *How about a schematic and layout?* If you can get up early enough and the band conditions are good, you may be able to hear him and Ed, WØLFE, who are at it every morning. These two operators have maintained a very consistent schedule for well over two years now.

## Six Meter Sideband

Bob, W9BLZ, at Granite City, Illinois is using a 10B with 829B final feeding a 6 element Telrex up 70'. The receiving system consists of a National NC-270 and an SX-42. The 10B is modified as the May, 1957 *QST* specified which mixes 41 mc with the 9 mc master oscillator of the original 10B. Bob does quite a respectable job for the small amount of power he runs on sideband.

John, KØLSK, in Festus, Missouri (about 30 miles South of St. Louis) has his new d.s.b. rig on the air. John is working towards some higher power and hope to get things going before long. Jack, KØBST, in Manchester, Mo., has a nice sideband signal on 50 mc. He has also constructed a small d.s.b. rig, this one using a 12BY7 balanced modulator and an 807 final. Jack, being one of the clever set, has a very ingenious way of getting the carrier in and out of this gem. To "unbalance" this balanced modulator to operate with some carrier, he merely took another 12BH7 and cut the tube pins off one side. When Jack wants to insert some carrier, he merely reaches over and plugs in the appropriate tube to give him d.s.b. or a.m. *Clever, eh?*

Paul, W4CSN, in Henderson, Ky., can be found on sideband with his 20A and P&H mixer. Paul works out very well on six meters from the southwestern part of Kentucky. He is usually on about 10:30 AM 'till noon at

[*Continued on page 99*]

# VHF

ALLEN KATZ*, K2UYH

THIS idea of Winter being a time of stagnation appalls me. Too many u.h.f. enthusiasts look on the coming of the winter season with dread, and, when the month of December rolls around, they throw in the towel until better weather comes once again. True, Winter, as it affects us, means the end of tropospheric "openings," antenna work, and mountain expeditions, but what about the other phases of u.h.f. operation? Openings may be few, but local contact conditions will be better, what with the absence of u.h.f. energy-absorbing foliage and all. Here's an excellent opportunity to finish up that old construction project or to start a new one while you monitor the bands.

## Activities

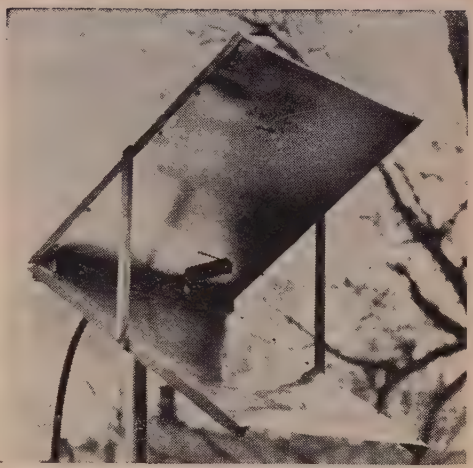
**Project Moon Bounce from W6DNG and K1HMU:** "This is a summary of results in the series of moon bounce tests between us on 144 mc in the period between August 24 to September 15, 1962. No valid contracts resulted, but we came mighty close several times." *Editor's comment: space doesn't permit our printing the entire summary, but suffice it to say that results were indeed favorable, both stations having heard each other intermittently.* "Except for the various mishaps incurred, a QSO should certainly have been possible on September 3, 11 and 12.

"Various strange things came to light after these tests. It seems that the only thing holding us back was propagation, since in no case was there strictly one-way transmissions. It is also confirmed by both stations that except for the 8th of September, signals were *always* stronger at the beginning of the skeds, rather than sporadically later on. This could, of course, be due to operator fatigue, but in many cases the signals were at a comfortable signal-above-noise level right at the start. On September 8 the signals became audible at both stations at about the same time. Don't have an answer to this one.

"The variable strength of the signals on different days is due to the Faraday rotation. The monster antenna at K1HMU (16 stacked 32 foot yagis) was not putting out true circular polarization, as evidenced by later neon bulb tests. This was probably due to the mass of phasing line required, and the particular system used to phase the cross Yagis ¼ wave apart. Improvements are planned. The antenna at W6DNG was two 42 element cross-Yagis with staggered elements twin fed with two coax lines. The antennas are spaced 20 feet and about 28 feet long — about 23 db in the unelevated position. This antenna was much more likely putting out circular polarization. The joker here is that W6DNG was hearing his own echoes *without* switching (from right hand circular polarization to left hand circular polarization, *etc.*) Theoretically, this is impossible. If W6DNG transmits a right hand signal, it *should* be reversed into a left hand signal when it hits the moon. Upon its return the antenna should have to be switched to left hand to receive it. K1HMU, religiously switching his polarization, was completely unable to hear echoes.

"Further skeds between K1HMU and W6DNG are planned for late December. A recent letter from KL7AVD indicates that he is in operation and ready to go. CT3AE indicates that he will be ready soon." *Many thanks Bill and Ned! Good luck!*

*48 Cumberland Avenue, Verona, New Jersey.



**Simple 1220 mc corner reflector antenna at K2RGF.**

**K2QKR reports on the September contest:** The "62-20 VHF Club" operated during the ARRL VHF Contest from Bearfort Mt. in West Milford, N. J. Our setup on 1296 mc was 30 feet up on a 65 foot fire tower. The transmitter was a converted APX-6 with a Class C coaxial tank amplifier using a 2C39A running 25 watts input.

"Here are some pointers on how to make more successful contacts. We find these very valuable:

1) Use of a map with a compass to pinpoint both locations.
2) Fairly accurate calibration of receiver and transmitter.
3) A tone modulated signal for "homing in." The frequency should be between 2 and 5 kc. This above all is most important. It allows both parties to orient antennas and tune receivers for maximum signal (tone).
4) Make schedules on the lower frequencies (144, 220 mc *etc.*). Keep in contact on these lower frequencies until a complete contact is made by both parties.
5) An antenna with good beamwidth, not too sharp or too broad.

*—Lee, you might also add the use of a second APX-6 to beat your transmitter against the frequency of the other station; putting you both on the same frequency, and assuring easier future QSO's.*

"If the fellows follow these ideas plus a few of their own, I am sure many more successful contact can be established.

"During the contest the only 1296 mc station we worked successfully was W2DZA. In fact, he was worked on all five bands, 50 through 1296 mc. The group also had schedules with W2HZZ and W1GB. We tried for over half an hour to make contact with W2HZZ, but no such luck. Maybe next time?" *Thanks for the letter, Lee. Keep them coming.*

**1215 mc report from WA2VTR, Tallman, N. Y.:** "W2ITE, Marv Axt, of Spring Valley, N. Y., WA2YEC,

Paul Vilardi, Tallman, N. Y., and myself have been active on 1215 mc since June, 1961, using converted APX-6's. Antennas have been various dipoles, corner reflectors and dishes, as well as one collinear. Successful two-way contacts have been made over distances up to 16 miles, and a first is claimed! Continuous 100% two-way mobile in motion over distances up to 1.8 miles on 1215 mc (car to base)." *How about some pictures fellows?* "Will try to be on the air at 7:30 PM EST every Wednesday, usually vertically polarized."

**Jud, K2CBA, at new Rensselaer, N. Y., QTH:** "Haven't been very active this past summer . . . been getting antennas up at our new QTH. I have a 115′ rotating tower up with four 9 element long Yagis for 50 mc, two 13 element 24′ long Yagis for 144 mc, one 13 element 15½′ Yagi for 220 mc, and a 32 element ¾ wavelength spaced collinear on 432 mc." *Some antenna system, eh?* "Recently moved the 432 mc antenna above the tower (120′) and was surprised to work K2UUR, W2DWJ and W2MDE one evening without any prearranged schedules. 432 mc really works! I also have a 1296 mc 32 element broadside antenna and four 13 element Yagis for 220 mc." *How about some skeds on 1296 when you get set up, Jud?* "The new QTH is 580 feet above sea level and a clear horizon in all directions; it seems to have made a tremendous improvement."

## 220 mc and Up

Don, WA2SAB, is on 1215 mc from Oakland, New Jersey with an APX-6 and looking for skeds. Paul, K3IEW located in Aberdeen, Maryland, is on 432 mc with a 4 × 150 tripler and on 1215 mc with a converted APX-6. WA2UGC, of Franklin Lakes, New Jersey, is on 1215 mc with an APX-6. Milt also has a rig almost ready to go for 220 mc. K3KDI is on 432.450 mc with a 4X150 tripler driven by 5894; receiver is a trough-line 6AM4 converter into HQ-180 at 50 mc; antenna is a 16 element collinear. Marty, W2VCG, is on 432 mc from Pennington, New Jersey, with a 5894 in the final, a 8058 converter and 32 element collinear antenna. Roger, WA2BHZ has constructed a 432 mc walkie-talkie and is looking for an initial contact. Charlie, WA2ISX, of Croton on the Hudson, New York, is interested in contacting other amateurs interested in Ham-TV. K2TDE will soon be on 432 mc from Dumont, New Jersey.

## 432 mc Report

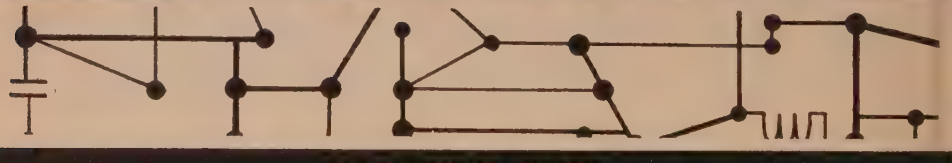
**W5HPT, Bedford, Texas:** Vic, who uses a 13 element Yagi 55′ up on 432 mc, reports that there was an excellent tropospheric opening on August 4, during which he worked W5RCI, in Marks, Mississippi, about 450 miles away. He also mentioned that W5SWV in Denison, Texas, worked K9AAJ and that W5AJI in Dallas, worked K5TYP, Houston, (275 miles) on phone with better signal strength than he could achieve on two meters. Other stations active in Vic's area are W5JHC, W5HTZ, W5JWL, W5DSM and W5PEP.

**W8PT, Benton Harbor, Michigan:** Jack is on 432.000 with four 15 element Yagis in a nine foot quad up 52′ and recently worked W9BTI, Milwaukee, Wisc., W9AAG, Woodhull, Ill., WØHND, in Davenport, Iowa, and W8RQI, Toledo, Ohio. On the 23rd of August, Jack again worked W8RQI besides W8HCC, Sandusky, Ohio, W8JLQ, Toledo, Ohio; on September 19, W8PT worked W8IFX (275 miles away in Cincinnati). Other stations worked by W8PT during the month of September were W9's ZIH, UIF, AQP, NAU, and JEC on 432 mc. Jack holds skeds with W8RQI on 432.050 mc at 2130 EST Tuesdays and Thursdays, and with W8HCC following his W8RQI schedule. He is interested in 432 skeds with Minnesota, Missouri, Tenn., Ky., Pa., and West Va. *What do you say fellows?*

**W3RUE, Bellevernon, Pennsylvania:** Ted, using a 16 element homebrew collinear 72′ high, worked K8AXU in Sisterville, West Virginia for his third state on 432 and a possible first West Virginia - Pennsylvania 432 mc contact (on August 30), and W8IFX (270 miles) for the first Pittsburgh area-Cincinnati contact on 432. Ted holds schedules with W3MMV in York, Pa., 432.0 mc between 2130 and 2140 EST and with W8TYY of Columbus, Ohio on 432.100 mc between 2150 and 2200 EST every night. W3RUE's frequency is 432.040 mc.

Merry Christmas, Allen, K2UYH

# the answerman



KEN PHILLIPS*, K8CHE

*Have you experienced difficulties in your v.h.f. construction? Drop a line to K8CHE!*

I HAVE a pair of 4 element beams stacked above a pair of four element beams. My standing wave meter indicates a s.w.r. of 2:1. What length should I cut my coax feedline to reduce my standing waves to 1:1?"

—R. E. B., Akron, Ohio

The best advice I can give at the moment to reduce your voltage standing wave ratio (v.s.w.r.) by trimming your feedline is to cut it all off! Let us consider for a moment the basic elements that prompt us to make the above answer. The v.s.w.r. by definition is the ratio of the highest and the lowest voltage measured at points along a transmission line. These voltages are created by algebraicly adding the "outgoing" r.f. voltages and the "reflected" r.f. voltages. When a feedline is terminated in a load of "pure resistance" equal to the impedance of the feedline, all the power is absorbed in the load and none is reflected. This condition is not easy to meet in most antenna systems. The load is seldom a pure resistance but is contaminated by the presence of capacitive or inductive reactances. Under these conditions the power that is not dissipated by the load is reflected back toward the source, which in our case is the transmitter. Since the phase of this reflected power is not the same as the outgoing power, as indicated above it adds and subtracts at various points to produce various voltage or current peaks or nulls. If the voltage

*351 Hillman Road, Akron, Ohio.

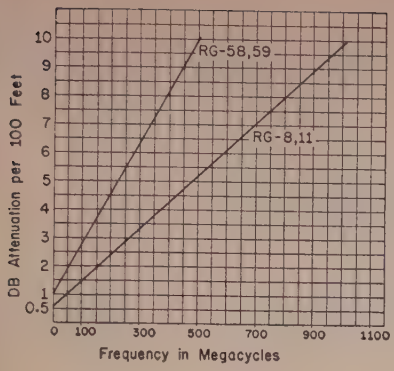



Figure 1—Normal attenuation of coax feedline as referenced to frequency. The difference betwen RG-58 and RG-59 is so small that they have been shown as a single line, as with RG-8 and 11.

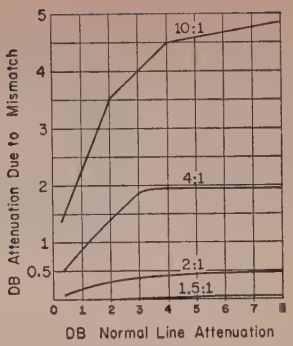



Figure 2—Line attenuation due to v.s.w.r.

peaks and the nulls were plotted graphically by amplitude, the resulting graph would be the v.s.w.r. of your transmission line.

Since the v.s.w.r. is controlled by the load or antenna impedance of your system, the v.s.w.r. is equal to the ratio of the line impedance to the antenna feedpoint impedance and it is *theoretically* impossible to change the v.s.w.r. by trimming the feed line!

### Cutting the Line . . .

Under some operating conditions, however, it is feasible to cut the transmission line to a specific length. When the transmission line length is ½ wavelength of the operating frequency (or multiples of ½ wavelength) the impedance that the transmitter "sees" is identical to the impedance of the load, which in our case is the antenna.

Since the size of the transmitter output coils and tuning capacitors are fixed (not replaceable plug-in units), we are limited by the amount of reactance, either capacitive or inductive that we can tune-out with the system. By trimming the feedline we can often shift the reactance toward either the C or L side so that load requirements fall within the capabilities of our transmitter and we can therefore pull more power out of our final. *The v.s.w.r. of our system is the same and cannot be changed by adjusting the length of the feedline.*

My recommendation is to first try to adjust the antenna so that the feedpoint impedance is nearly equal the line impedance. Actually, Bob, the losses associated by the v.s.w.r. are very small in the v.h.f. region and are much less than the normal coax line attenuation. In fact, in the example you mentioned of a 2:1 condition the v.s.w.r. losses are only 0.3 db at 50 mc, 0.4 db at 144 mc, and never more than ½db up to 500 mc. If you have 100 ft. of RG/8 coax, the losses at 50 mc are about 1.4 db, at 144 mc 2.75 db, and about 6 db at 500 mc. So you see the v.s.w.r. losses are really smaller than most amateurs are lead to believe.

Two graphs are included as figures 1 and 2 to give you a better picture of the situation. Figure 1 shows the normal feedline losses with the most common coax. This graph is optimized in that the small coax (RG-58 and 59) and the large coax (RG-8 and RG/11 are averaged and shown as only two lines for simplicity.

If you are really interested in setting up a good antenna system, I suggest that you obtain an impedance bridge and measure the actual impedance of your antenna. This device in conjunction with a grid dip meter will diagnose your system with much more detail than the other various "in line" meters. Allied Radio Corporation list a Knight-kit Model Z-52 s.w.r. and Z-Bridge for only $6.95. Check on this interesting item. This important tool seems to have been overlooked in our rush to obtain the latest gadgets.

### Question—Procedure?

I'm a newcomer to the v.h.f. bands and some of the things I hear are a bit confusing. What is the correct procedure to use on phone when calling a station and also in turning the conversation back to him? What's this 'break, break?' —R. E. K., Virginia

Well, Ralph, rest assured that they do not mean a compound fracture of the cranium when they say "break-break," but every time I hear it I am tempted to make certain readjustments in someone's boney system. About the only place that the word "break" has for phone use is in message handling. It is used to separate the address from the text. The address is sent, the word "break," then the text of the message. After the signature the word "break" should be sent again indicating the end of the message. So, every time I hear a station say "break-break" during a QSO, I have a feeling that I have just heard the fastest message sender in the world! Really, I suppose, when the words are used during a QSO they are intended to mean "over" for the other person to give an immediate answer to a question . . . or something. But since it *means* over, over is the correct word to use.

73, Ken, K8CHE

# DX report

DANIEL L. PARNES*, WA2DMQ ROBERT M. BROWN*, K2ZSQ

It won't be too long now before the frost is off the pumpkin and onto the long Yagi. Winter is nigh at hand, and atmospheric temperatures are taking their usual nosedive leaving us with occasional frozen rotators and cracked feedlines. The migration of hams from cold rooftops to warm cellars will soon be complete. Antenna work will shortly become a physical impossibility. This is the season to really *enjoy* that equipment on the operating table. There isn't much else you can do except shovel snow . . .

Why not make the best of it? Make this your "on-the-air" instead of "off" season. For some strange reason in recent years v.h.f. activity seems to have paralleled the thermometer; as temperatures drop, activity drops. This shouldn't be. True, tropospheric conditions in our atmosphere begin to steady themselves, leaving us with a slightly curtailed working radius, but this is no excuse to let the rig gather dust. No DX? Hogwash.

## 50 mc Activities

**W2:** Donn Baker, WA2VOI from Salamanca, N. Y. reports working KØGUB, Sheldon, Ia., and WA4EPY, Ozone, Tenn. this summer. Donn uses his own homebrew two element portable beam which shows that to work skip via sporadic-E clouds, one doesn't need elaborate arrays. A final summer note arrived from WA2RQC that on July 3rd, YV5AGM and on August 7th, VO1DW were worked by WA2RQC, Corinth, N. Y. WA2TQT, N. Y. C., had been working quite a bit of ground wave during late August and early September in addition to a few sporadic-E contacts. Some ground wave stations worked were K3IKQ, W3VXJ, W3DZI, K3TYF, W3OR, K3MLI, K3EGP, W3WJC, K3HNP, W3KX; all in Pa. plus stations in Conn., Del., and Southern N. J.

This station (WA2DMQ) really enjoyed the good trophospheric conditions which existed between September 24 and October 5, by working W3KIZ (Pa.), K1SAK (R. I.), K4VWH (Va.), and K1RGQ/1 on Mt. Graylock in the northwest corner of Mass. Calls were heard in Conn., Del., Md., and western N. Y., in addition to those worked.

**W3:** From Baltimore, Md., W3QA has been working into Virginia, southern New Jersey, and eastern Pennsylvania on ground wave during September.

**W4:** K4TBG, Fla., fired up her rig on September 6 and worked KP4CK and KP4BCS. The next day she worked stations in Texas, New Jersey, Pennsylvania, Virginia, Ohio, Tenn., Mich, N. C., Ind., and Ill. *All in one day!* A Nashville, Tenn. sidebander, W4HHY, worked WØBBM, Imperial, Mo. on the 14th of September.

**The VHF Amateur,* 300 West 43rd St., New York 36, N. Y.

**Here's Martha Hrenko, K3RVS, of Darlington Pa. (city sure fits the personality!).**

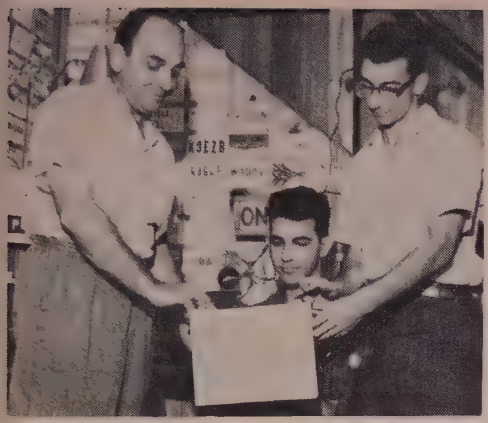
W4HHY estimates the distance to be about 275 miles. The only double hop station that WA4DKG, Dayton Beach, Fla. worked, for a mere 2025 mile contact, wa K7EXA in Phoenix, Ariz. W4IMX, Nashville, Tenn. writes ". . . am working on a deal to trade a Communicator III for an 829B rig, HQ-160, and Tecraft converter. If I do, will be on 6 with more power and better receiver setup." *We'll all be listening for ya, Bill!*

**W6:** "Activity here has been only of a local nature Los Angeles comes in regularly. Since the 26th of Jul one brief opening. This was on August 26 at 2035 GM when WØAGY in Denver, Colo. was heard. About 1 minutes earlier I heard WA6GZD in QSO with the WØ but I could not hear the Colorado station." So report W6IEY from Le Mesa, Calif.

**W7:** From Aloha, Ore., K7IMH heard Colorado, Ari zona, and California for a short duration with roug copy in August. So in disgust Jim went to work on hi home station. He now has a kw (c.w. and s.s.b.) for meters and soon will have a kilowatt on 2 meters, a.m and c.w. On September 20, K7EZP, of Forest Grove Ore. worked K7LBD, Yakima, Wash. The difficulty i the contact was getting over Cascade Mts. Says K7EZP "In our particular location we are able to get over th Cascade Mts. by bouncing our signal off Mt. Adams (we think) into Yakima. This is one of the few instance a signal can get over the mountains on ground wave."

And finally some notes on scatter from Loren Parks K7AAD, Beaverton, Ore. ". . . As you may know, a few of us here on the West Coast have been active in scatte work for some time. When Ed Tilton was out here fo the convention I discussed what we had been doing an to my surprise, I found out that not too much is goin on in the East in this type of work. Apparently there i a little activity in the Midwest. . . . There is no difficult in getting contest-type information across the full lengt of the West Coast. The fellows in Seattle work L.A. ever week and I don't know but what we might get well int Mexico. An east-west path may be much harder, bu we have only had one or two stations try and they wer both in Rapid City, S. D.

"Scatter is a technical challenge. You don't do it wit



**Happy trio these: The Citrenbaum's, K3NMK, K3MOY, and K3KST respectively.**

an 829B. Scatter could stand some promoting. You can do a lot with a hundred watts into the antenna; and that's not awfully expensive. My first work was done with 80 watts in, though I thought at the time that it was much more. I presently run 450 watts into my 11 el. Spiralray. I have worked L.A. with my antenna on the ground on scatter. We have also done some diversity experiments (space) and I'm setting up another tower for experiments along this line with W6FZA . . . I think it takes repeated exposure to motivate people. We can see this in the recent growth on the West Coast. . . ."

**W8:** In the first half of September K8AIZ, in Mich. worked via groundwave on the 3rd, 5th, and 13th, Ohio and Pa. On the 12th via aurora, K4YZF, Ky. and W9QS/maritime mobile on the Great Lakes were contacted by K8AIZ. Vince Varnas, K8REG, of Dayton, Ohio, worked Ill., W. Va., Tex., Pa., R.I., Mass., and Cleveland, Ohio during August. One New York contact, K2OBV, came in through the aurora on August 21.

**W9:** Our VHF SSB columnist, Bob Heil, K9EID, worked W8TFI and W8ESZ, both in Mich., during the aurora on Sept. 12. These two contacts were two-way sideband. "Five by nine" sigs were heard by W9VPP of La Crosse, Wisconsin, on skip stations in Tex., Ala., and N. C. this past August. K9DTB, of Villa Park, Ill., who is on s.s.b. works into Mich., and Wis., on groundwave quite regularly. K8NEY, in Michigan was the farthest groundwave contact for K9DTB (about 250 miles) in August.

**WØ:** Jim McMechan, WØPFP, of Ames, Iowa, worked KØREE, of Topeka, Kansas, via tropo on September 16. We received a nice letter from WØDLL in Nebraska saying, 50 mc activity was practically non-existent during the last part of August and the first part of September. It's caused by several things: vacations, a practically dead band, and the antenna being too darn low.

"Will be on the air sometime during the first part of October with a 5 element Yagi at 40' and a two nuvistor preamplifier ahead of the National 183D. Hope to have more to report from the Midwest by then."

## 144 mc Activities

**W1:** Walt Belsito, K1RTS, of Waterbury, Conn., worked into the fourth call district on August 3rd by contacting W4KZC and K4HZY. Walt approximates the distance of these two Virginian contacts to be around 350 miles. *Nice haul!* Later in the month W1MEH, of Easton, Conn., worked four stations in Virginia, one in New York, and one in Ontario, Canada. The Virginians' signals peaked over S9. W2ROA, the New York state contact, was received 569, while the Canadian, VE3BPR, came in at 56. Incidentally VE3BPR and W1MEH were both on 144 mc s.s.b.

When this next report crossed our desk, it was immediately filed under 50 mc news. Much to our amazement, however, at second glance it did turn out to be 2 meters! Judge for yourself. . . . During the period between August 15 and September 13, stations were worked by

[*Continued on page 100*]

# SKED BOX

Policy: Although the Sked Box will appear every month, your listing must be re-submitted to be repeated. No listings are held over. *Deadline for Sked Box listings is the 20th of the month.* All data received after that date will be run the following month. Listings must be submitted on a postcard or the Reader's Reporting Form. Give as complete information as possible. Listings are compiled first by frequency, then by call area. Address all requests to: "Sked Box," *The VHF Amateur*, 300 West 43rd Street, New York 36, New York.

### Schedules Wanted—50 Mc

**K1PDA** to W.Va. N.Y. Write: 20 S. Lincoln St., Manchester, N.H.

**WA2GWM** to Md., Del. Write: 14 Orange Ave., E. Paterson, N.J.

**WA2OCK** to Del. Write: 51 Tanglewood Ln., Berkeley Heights, N.J.

**WA2TQT** to Pa. Write: 406 W. 44th St., New York 36, N.Y.

**WA2VCM** to N.J., Md. Write: 37 Bradford St., Auburn, N.Y.

**WA4AWH** to S.C. Write: 807 Cowan St., Shelbyville, Tenn.

**WA4BXU** to Ky. Write: 806 East St. S., Talladega La.

**WA4DKG** to Macon, Ga. Write: 540 Tarragona Way, Daytona Beach, Fla.

**W4HHY** to La., S.C. Write: 3708 Grubbs Rd., Nashville, Tenn.

**W4IMX** to Ga., Miss., Ark. Write: 2406 Sterling Rd., Nashville 12, Tenn.

**W5UKQ** to Austin, Dallas, Texas. Write: 363 S. Acadian Thruway, Baton Rouge, La.

**W6FZA** weekend scatter. Write: 167 Leggett Dr., Porterville, Calif.

**K6HCP** weekend scatter. Write: 1109 Norval Way, San Jose, Calif.

**W6NLZ** weekend scatter. Write: 2228 Via La Brea, Palos Verdes Estates, Calif.

**W6OKR** weekend scatter. Write: 10 Parkway, Larkspur, Calif.

**W6SSN** weekend scatter. Write: 888 Marin Rd., El Solbrante, Calif.

**K8AIZ** to W.Va., N.Y. Write: 359 Chalfonte, Grosse Pointe Farms 36, Mich.

**K8REG** to Mass. Write: 4329 Renwood Dr., Dayton, Ohio.

**K9EID** to Kansas City, and Ark. Write: 402 Border Street, Marissa, Ill.

**WØCMI** to Ky., Tenn., Iowa. Write: 3 Gocke Pl. Overland 14, Mo.

### Schedules Wanted—144 Mc

**K1RTS** to W.Va. Write: 38 Wildwood Ave., Waterbury, Conn.

**WN2AOG** to N.H. Write: 513 Linden Ave., Rahway, N.J.

**WA4DKG** to Macon and Atlanta, Ga. Write: 540 Tarragona Way, Daytona Beach, Fla.

**K8AQA** to Toledo, Ohio. Write: 916 S. Jefferson, Saginaw, Mich.

**K9CGD** to Mo., N. Wisc., Iowa. Write: 2427 Westover Ave., No. Riverside, Ill.

**K9DTB** to Ky. Write: 531 Illinois Ave., Villa Park, Ill.

# the VHF TWINS

## MODEL 6-150 SIX METER TRANSMITTING CONVERTER

Converts the 20 meter output of your SSB, AM or CW exciter to 6 meters. Power input to 8117 final; 175 watts PEP on SSB, 165 watts CW, 90 watts linear AM. Resistive pi-pad permits operation with any 10 to 100 watt output VFO or crystal controlled exciter. Meter reads; PA grid, PA plate, Relative output. 50-70 ohm input and output. Quiet forced air cooling. Modernistic, recessed panel cabinet 9" x 15" x 10½".

COMPLETE WITH BUILT-IN POWER SUPPLY, TUBES AND CRYSTAL .....$299.95*

## MODEL 2-150 TWO METER TRANSMITTING CONVERTER

The MODEL 2-150 converts the 20 meter output of your SSB, AM or CW exciter to 2 meters. Resistive pi-pad permits operation with any 10 to 100 watt output exciter, either VFO or crystal controlled. Power input to 7854 final; 175 watts PEP on SSB, 165 watts CW, 90 watts linear AM. Meter reads PA grid, PA plate, Relative output. 50-70 ohm input and output. Quiet forced air cooling. Modernistic, recessed panel grey cabinet, 9" x 15" x 10½".

COMPLETE WITH BUILT-IN POWER SUPPLY, TUBES AND CRYSTAL .....$329.95*

*Slightly higher West of Rockies

WRITE FOR INFORMATION

P & H ELECTRONICS INC.
424 Columbia , Lafayette, Ind.


# VHF Balun


IRWIN MATH, WA2NDM
126B Taylor Avenue
East Brunswick, New Jersey


A VERY inexpensive and useful balun transformer can be built from the watching coils found in many old TV sets of the 1950 vintage. These coils are located right at the antenna terminals of the TV set. They are easily recognized by their construction: about 30 turns of tinned wire on a green ribbed ½" diameter plastic form.

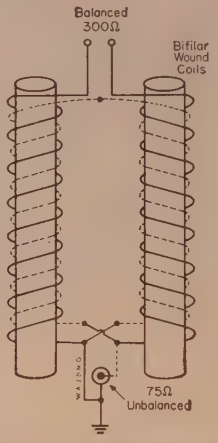



**Fig. 1—V.h.f. balun from TV set.**

The coils are mounted in a small 4 × 2¼ × 2¼" aluminum minibox with binding posts (or a terminal strip) for the high impedance winding, and an SO-239 coaxial fitting for the low impedance winding. These coils, when connected as shown in the diagram, have an impedance of 300 ohms balanced (TV twin lead) at one end and 75 ohms unbalanced (RG-59/U) at the other end. The frequency range of the coils is from approximately 50 to 230 mc. Either end may be the input and the other the output. ■


6 AND 2 METER AMPLIFIERS
— also —
Universal DC power supplies for these units and others.
Write for further information
J&D LABS
73 HIGHWAY #35, EATONTOWN, N.J.
PHONE 542 — 0840 AREA CODE 201

HAVE YOU SEEN PAGE 6

For further information, check number 37, on page 128

50.110 mc on Sunday mornings. Be sure and look for him. Ellis, K9SDA, has a 20A receiving a home brew mixer with a 2E26 in the final. Ellis has a Drake 1A receiver and a 4 element antenna at 50'.

### Balanced Carrier for the 20A

If you owners of the Central Electronics 10B or 20A series have had trouble in getting the carrier balanced out with the 1K potentiometers that are in the balanced modulators from the factory, here is a little jewel that will make it quite easy to get rid of that sometimes annoying carrier. Careful observation of figure 1 will show that $R_{23}$ and $R_{25}$ are 1000 ohm 2 watt potentiometers. Replace these with 250 ohm 2 watt pots with a 180 ohm 1 watt resistor on each end. Don't forget to replace the .005 mf capacitor across the network. This modification makes nulling the carrier a simple and easy job, whereas before it was extremely "touchy" to get rid of it all.

Figure 2 may also be of help. Some have mentioned that the 20A's delay time, is on occasion, short. By simply adding a 47K resistor, a 500K

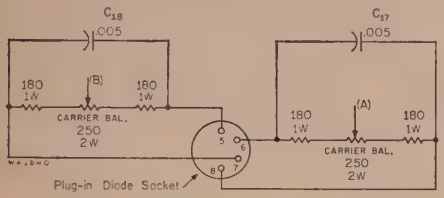



**Figure 1—One method of obtaining a more s.s.b. with less a.m. on the 20A. See text.**

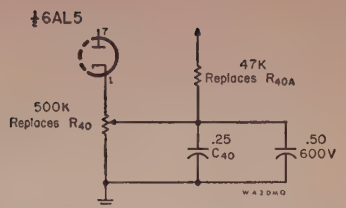



**Figure 2—Modified vox circuit in the 20A to lengthen the delay time. See text.**

potentiometer, and a 0.5 mf @ 600 v. capacitor, this delay time can be lengthened as desired. Remove $R_{40}$ and $R_{40a}$. Drill a hole for the pot in the back panel to the left of the power socket between the power plug and the 110 v.a.c. line cord grommet. Now install the 500K pot in this hole and the 0.5 mf capacitor parallel to C40. By varying this capacitor, the hold in time can thus be lengthened. Now solder the 47K resistor in place of $R_{40a}$ and connect it to the center arm of the pot. Refer again to figure 2. As this pot is rotated, the vox will hold in as long as you desire after you stop talking. This'll help you keep the vox closed while transmitting without having to say the familiar, "ah." Try it!

### Windup

Don't forget to send in your ideas, comments, and photos for the column. You do remember that this is your column, don't you. I want to wish all of the readers a very Merry Christmas. I hope that Santa brings you a new sideband rig for the v.h.f. bands!

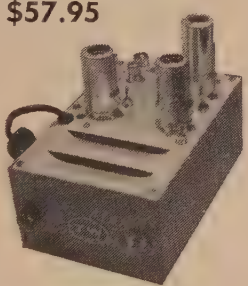
73, Bob, K9EID


*From England!*

**Now Available In the United States — The Rugged British Line of TW 2 or 6 Meter Equipment.**

**$57.95**

- Low Noise Nuvistor Preamp
- 2 or 6 Meter Converter—Crystal Controlled
- Built-in 110 v.a.c. Power Supply
- Available With Your Choice of I.F. Outputs
- Small; Compact, Rugged, Self-Contained. 6" Deep, 4" Wide. Overall Height 4".



**NEW . . . TW-2 Transmitter**

- Full 15 watts input on 50 mc (6360)
- Push Pull Modulator
- Meter Switching
- Choice of 6 or 12 Volts
- Crystal & Key Jack on Front Panel
- Hi-Z Mike Input
- 6" W x 5" H x 7" Deep

**$89.95**

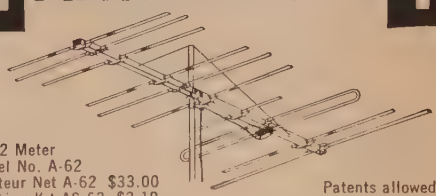
**—product of T. Withers (Electronics) Enfield, England**

**BOB LEE** Sole U.S. Agent | 1110 Cathedral Ave. Franklin Square, N.Y.

For further information, check number 31, on page 128



**2 ANTENNAS IN 1**



6 & 2 Meter
Model No. A-62
Amateur Net A-62 $33.00
Stacking Kit AS-62 $2.19

Patents allowed and pending

*The Only Single Feed Line*
**6 and 2 METER COMBINATION YAGI ANTENNA**
*another first from* **FINCO®**

**ON 2 METERS**
18 Elements
1 — Folded Dipole Plus Special Phasing Stub
1 — 3 Element Colinear Reflector
4 — 3 Element Colinear Directors

**ON 6 METERS**
Full 4 Elements
1 — Folded Dipole
1 — Reflector
2 — Directors

See your FINCO Distributor or write for Catalog 20-226

**THE FINNEY COMPANY**
Dept. 19 Bedford, Ohio

For further information, check number 32, on page 128

## DX REPORT [*from page 97*]

W1AJR, of Middletown, Rhode Island, in Mich., Ohio, Ind., Va., N. C., Penn., and Ontario, Canada. VE3BQN and W8YIO were worked on Sept. 9 via aurora. The 850 mile path to K9UIS of Barrington, Ill., couldn't have been possible were it not for good tropospheric conditions, reports W1AJR.

**W2:** On September 15 within one twelve hour period WB2AAI, Tom Kneitel, qualified for the "WAB Award" (Worked All Brothers), which was awarded for QSO'ing three of the fellows at the Graymoor Monastery in Garrison, New York. Tom, using only 6 watts and a halo antenna, recently worked WA2RRK, WA2TCA, and WA2PCM (all monks) for a nice 50-mile path.

**W3:** W3QA of Baltimore, Maryland, is making lots of "noise" working into Conn., N. J., N. Y., Pa., and Va. Bruce worked W1MEH on Sept. 5. All of W3QA's long distance hauls have been on c.w., natch. *Why not pick up this tip and give c.w. a run for its money?* W3RUE of Belle Vernon, Pa., worked several choice states during August: Wisc., Ill., R. I., N. Y., Mass., Del., and Ky. All these were c.w. "More QSO's with less QRM," says Ted.

**W4:** Tom Larrivee, WA4DKG, of Daytona Beach, Fla., writes, "There has been excellent ground wave most of this month (August). No really, good DX, however, although we did hear Maine on the 5th."

**W5:** Signal strength was S3-4 with QSB during W5HPT's 275 mile contact with K5TYP in Houston, Texas. The antennas at the QTH of W5HPT in Bedford, Texas, were an eight over eight, 50 feet up.

**W6:** W6IEY of La Mesa, California, reports that ". . . The best DX that I heard during September was W8UVJ/6 on Santa Rosa Island, approximately 239 miles north of here. He comes in like a 'bomb' on the over-the-water path.

"I have been getting in more construction time lately than operating time. One of my projects is a converter for satellite monitoring, in addition to several power supplies and some test equipment.

**W8:** Jack Woodruff, W8PT, of Benton Harbor, Mich., worked K2YCO in Rochester, N. Y., and heard K1CRQ/8, VE3BQN, VE3ELA, W8YIO, K9UIF, W8KAY, W8LCA, and W9BUZ during the aurora on the 8th of Sept. K8AQA of Saginaw, Mich., says that the band was in excellent condition on the evening of August 23. K8AQA QSO'd K9CHS in Marion, Ind., for 25 minutes before the band changed and they lost contact. On the same night VE3AHF of Gorrie, Ontario, was also worked.

**W9:** A 200 mile path was breached by K9CGD of North Riverside, Ill., on August 14 by contacting K8TCA in Horton, Michigan. Bob, K9CGD, uses an SX-101A receiver, and a homebrew crystal controlled converter. To add even more sensitivity, Bob built a preamplifier using nuvistors. K9DTB heard the W2, W8, W9, WØ and W4 call areas on August 15. Phil reports excellent trophospheric conditions on that date. During late August, K9EID worked W9MAL, W9RVM and W9GWL, all well beyond the 200 mile mark.

*73, Dan, WA2DMQ*
*Bob, K2ZSQ*


### In The Works

**"Safari on Six," a DXpedition to the Virgin Islands, by KV4CQ.**

**"Getting Along with the Indians," a series on getting rid of TVI, by K3HNP.**

**"Complete 6 Meter SSB Transmitter," simple but effective way to get on sideband with a 2E26, by K9SFX and K9EID.**

**"Understanding Pulse Modulation," a ham's language article on v.h.f. applications of pulsed emission, by WA2TQF.**

Read *The VHF Amateur*—published exclusively for the v.h.f. enthusiast.


# Reader Reporting Form

**Fill Out Now!** **Month of November, 1962**

This form serves as the basis for our DX REPORT column in *The VHF Amateur*. Your participation in this program is of utmost importance, for without news-activities reports from you, we cannot provide a truly comprehensive column. *Deadline:* December 20, 1962. Return this form to: DX REPORT, *The VHF Amateur*, 300 West 43rd Street, New York 36, N.Y.

Your name ..... Call .....

Address ..... City ..... State

This report covers my 6 2 220 432 (circle one) activities for the period. Enter only one band's activities on this form. Extra forms free upon request. (S.A.S.E. please.)

Antenna (number of elements and type) .....

### Best DX During November

| Date | Time | Call | Location | Sig. Rpt. |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Sked Box Listing: Do you desire schedules to a particular area? (Give state.) .....

.....

Do you presently hold skeds? (List calls, times, days and frequencies) .....

.....

Approximate distance of longest contact made this month (give details: call, number of miles, day, *etc.*) .....

## Contest Calendar [*from page 64*]

Maybe they can stir up some 160 meter activity for us since it falls on the same date as our 160 Contest.

Complete details next month.

### Ed Note

Well, how did you do in our recent "Brawl"? The phone boys will be just about winding up their week-end as we go to press. The "brass pounders" will be at it about the time you are reading this issue.

A final reminder to Clubs that hope to be in the running for the *CQ* Plaque. Your score will not mean a thing if we don't receive a list from your secretary, indicating the members that were in the contest and also indicating their claimed scores. (Par. XI–9a.)

For you fellows that are swamped with QSL cards due to your contest activity, might we suggest you look into the service offered by the Continental QSL Club. A simple solution to your QSL headaches. See page 18 of the September *CQ*.

The United Nations Amateur Radio Club, an active group at the UN here in New York are applying for a station license, to be located at the UN Headquarters. If they can come up with an exotic call similiar to 4U1ITU they sure will be swamped with contacts. And if DXCC should ever give the UN separate country status, they really will be in business.

Congratulations to a member of our Contest Committee, "Mac" McIntire, W2BO who was one of the 36 recipients of a special plaque given to amateurs who have been licensed for 50 years. The presentation was made at the HARC Convention in New York on October. 13th. "Ben" Lazarus, W2JB was probably also elegible but his early days of "hamming" took place in Canada and he could not locate written proof of this activity.

Me? I'm the youngest holder of a two letter call. Remember? See you in the pile-ups. Do have a most joyous Christmas.

73 for now, Frank, W1WY

**Suggested Contest Calendar for Spring 1963**

| | | |
|---|---|---|
| January | 5-6 | (OPEN DATE) |
| *January | 12-13 | ARRL CD C.W. |
| *January | 19-20 | ARRL CD Phone |
| *January | 26-27 | *CQ* WW 160 |
| February | 2-3 | (OPEN DATE) |
| *February | 9-10 | ARRL DX Phone |
| *February | 16-17 | B E R U |
| *February | 16-17 | QCWA Party |
| *February | 23-24 | ARRL DX C.W. |
| *March | 2-3 | YL/OM Phone |
| *March | 9-10 | ARRL DX Phone |
| *March | 16-17 | YL/OM C.W. |
| *March | 23-24 | ARRL DX C.W. |
| *March | 23-24 | APDX (Pakistan) |
| *March | 30-31 | R E F C.W. |
| *March | 30-31 | *CQ* WW SSB |
| April | 6-7 | P Z K C.W. |
| *April | 13-14 | ARRL CD C.W. |
| April | 13-14 | P Z K Phone |
| *April | 20-21 | R E F Phone |
| *April | 20-21 | ARRL CD Phone |
| April | 20-21 | *CQ* WW VHF |
| April | 20-21 | Helvetia 22 |
| April | 27-28 | PACC C.W. |
| May | 4-5 | PACC Phone |
| May | 4-5 | USSR DX |
| May | 11-12 | OZ CCA C.W. |
| May | 18-19 | OZ CCA Phone |
| June | 1-2 | CHC Party |

With the very crowded Calendar of Events for the Spring season, it's not to early to start planning now.

You will note that many dates have already been established. Because of some necessary changes it was necessary to move other events to avoid a conflict. However it worked out pretty smoothly. The only bad conflict is on March 23rd, ARRL and APDX. Since the APDX is purposely held on that date to commemorate a national holiday, there is nothing much that can be done about it this year.

A copy of these suggested dates is being sent to the listed organizations. Remember these are *only* suggested dates.

*Dates already established.

## Propagation [*from page 62*]

low phase, discusses ionospheric propagation conditions in general, sunspot behavior and its influence on the various amateur bands, a sunspot cycle forecast for the remainder of the present cycle, and a band-by-band propagation forecast for the next four years. The report offers timely suggestions for getting the most out of each amateur band during the long period of low sunspot activity expected during the years ahead. Much of the information appearing in the Jacobs-Leinwoll report has not been published elsewhere, and it is fast becoming a valuable reference on the subject of sunspots and radio propagation. Copies of the booklet can be obtained from the *CQ* Circulation Dept., Box 55, 300 West 43rd Street, New York 36, N. Y. The price for a single copy, sent postpaid, is $1; while in quantities of 10 or more, the price is 75¢ per copy. Order your copies now to insure delivery before Christmas.

73 and Season's Greetings W3ASK

## Announcements [*from page 18*]

volts and a #43 lamp in series with the feed will indicate when it is on.

The oscillator frequency will vary with load and should be adjusted when in the circuit.

It is not known exactly where the serial numbers break so a visual inspection should be made. It might

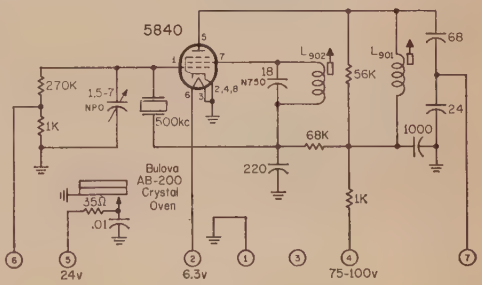



Fig. 1-Circuit of the calibrator for serial #2456 to #5602.

also be noted that this unit is employed in the AN/ARC-21.

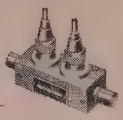
In fig. 1 in "A Simple Stable 220 Mc Transmitter," the following corrections should be noted in your October copy of *CQ*, page 46.

The 200 ohm resistor connected to the tap of $L_5$ should be 5K. The resistor across the crystal should be 100K. The filament of the 5894 should have pins 1 and 7 tied together with 5 to the 6.3 line. The author also suggests reversing the filaments of the 24G, grounding pin 1 and feeding pin 4. Ground pin 7 of the 6CL6. Sorry!

In fig. 1 "A U.H.F. Television Transmitter," *CQ*, April 1962, page 27, the resistor connected between pins 8 and 9 of the 931 should be 10K.

MicroMatch®

Wattmeters for SWR and RF power measurement • Station guardians for automatic transmitter and antenna protection • Dummy loads for transmitter test and alignment.



**576 SERIES** **$60.00**

Bidirectional coupler only, accurately calibrated to read SWR and RF power on a model 412R indicator or SG-33 station guardian.

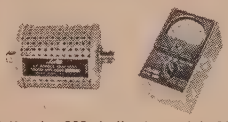
| Frequency Range | Power Range | Model Number |
|---|---|---|
| 3-30 MCS. | 0-1200 WATTS. | 576Z2 |
| 50-500 MCS. | 0-120 WATTS. | 576MW |
| 50-500 MCS. | 0-400 WATTS. | 576KE |
| 50-500 MCS. | 0-1200 WATTS. | 576MX |
| 50-1000 MCS. | 0-12 WATTS. | 576MY |

**261** **$22.50**

Bidirectional coupler 261, 0.5 to 225 MCS. Power range to 1000 watts. UHF type RF connectors. Complete instructions included to build 262 indicator.

**262** **$14.50**

Indicator 262. Use with 261 coupler. Provides readings of SWR and relative RF power. Selector switch provided for reading incident or reflected power.



**263** **$85.00**

VSWR and RF Wattmeter 263 similar to models 261 and 262 except calibrated to read VSWR and RF power in actual watts on three scales—10, 100, and 1000 watts, full scale.

**711N** **$135.00**

VSWR and RF Wattmeter 711N. 3 scales 0-30, 75, and 300 watts. Frequency range 25-1000 MCS.

**636K** **$87.50**

RF Dummy Load 636K. 1 KW continuous power rating, when 240 cubic feet air applied; 600 watts in still air. Other models available for powers of 50, 150, and 200 watts.

**SG-33** **$150.00**

Station guardian SG-33 will actuate an alarm and reduce or turn off power to the transmitter whenever load conditions or RF output change sufficiently to threaten damage to the equipment. It responds to a change in SWR and RF power. These functions are also indicated on a meter located on the front panel. The station guardian is designed for use with the 576 series bidirectional couplers.

**412R** **$50.00**

Indicator 412R is a standard 19" rack panel 3⅜" high. This indicator is designed for use with the 576 directional couplers. It reads forward power and reflected power in watts, and SWR directly on the meter. Meter only also available with complete instructions to build a 412R indicator.

**Microwave Devices, Inc.**
(Successor to M. C. Jones Electronics Co., Inc.)

SUBSIDIARY OF Benelix CORPORATION

For further information, check number 54, on page 128

## "Silver Sentry" [*from page 38*]

frequency standard, there is no reason why you can't, over a period of a couple of weeks, come up with something in the order of 7 or 8 c.p.s. drift per hour.

Ideally, all drift tests should be conducted in a room with thermostatically controlled heat.

Assemble the v.f.o. exactly as it will normally be operated. That is, with the tuner compartment surrounded by insulation and carefully enclosed in the outer box. Allow the unit to remain off for at least 8 hours prior to making a test run. After a 5 minute warm-up, zero the oscillator accurately on the 3600 kc harmonic of your 100 kc standard. Let the v.f.o. run with plate voltage applied for two hours. At the end of this period, reset the oscillator to zero beat with the standard. If you must reduce the capacity of $C_2$ to achieve zero beat, more negative compensation is required. Increase the capacity of $C_9$ and make another check, *tomorrow*. If you have to increase the capacity of $C_2$ to reach zero beat, the oscillator is already overcompensated. In this case, reduce the capacity of $C_9$.

The daily changes in $C_9$ should be small; just enough to shift the v.f.o. about 30 kc during the first few tests and then only 10 kc when you are approaching optimum compensation. Following each adjustment of $C_9$, bring the v.f.o. back to 3600 kc by touching up $C_3$. Otherwise, variations in $C_9$ will alter the total effective capacity in parallel with $C_2$ and the dial calibration will no longer hold.

Oscillator output tends to drop off at the high frequency end of its range. To compensate for this condition, peak $L_2$ and $L_3$ at 4.0 mc, and $L_4$ at 7.3 mc.

Although it was originally designed to drive transmitters that work with 3.5 and 7.0 mc crystals, you can easily adapt the v.f.o. to provide 5 mc energy for sideband heterodyning by using fewer turns on $L_1$. If $V_1$ refuses to oscillate with a smaller inductance, reduce the capacities of $C_{10}$ and $C_{11}$ slightly.

### *Conclusion*

You can buy v.f.o. kits that are more compact, less expensive and easier to build than the "Silver Sentry." You can buy ready-made oscillators with fancier styling and dials that are readable down to the last kilocycle. However, you'll have to dig mighty deep into a pocket stuffed with greenbacks before you come up with a v.f.o. that even approaches the Silver Sentry's on-the-air performance. If you're looking for a truly worthwhile construction project, try your hand at duplicating the prototype. You're bound to be pleased with the results. ■

## FW8BH [*from page 40*]

pink color.

After 20 minutes I returned to the KWM-2. 80 and 40 meters were completely dead. I

# 4 FOR TOP VALUE!

## FROM HARVEY

***NEW!***

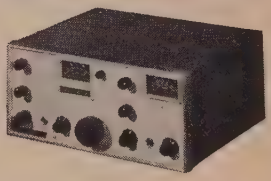
### COLLINS 32S-3 TRANSMITTER —

This exciting new transmitter by Collins is big news for the discerning ham . . . it features keyed carrier on CW ▪ Adjustable keying hardness control ▪ A zero-beat spotting control ▪ ALC ▪ Easier access to patch cords ▪ Sidetone level adjust ▪ For SSB or CW ▪ With the 32S-3 you'll have the cleanest signal on the air ▪

Amateur Net **$750**

***LATEST FROM NATIONAL!***

### The NCX-3 TRI-BAND TRANSCEIVER —



Complete SSB, AM, and CW coverage of the 80, 40, 20 meter amateur bands . . . many outstanding features for easy relaxed ham operation ▪ Full 200 watts PEP input ▪ Handsome, rugged NCX-3 complements both your car and ham shack ▪ VOX or push to talk ▪ CW break-in, SSB/CW AGC, S-meter ▪ Separate AM detector! ▪ **Available in December!** Order **now** for early delivery ▪

Amateur Net **$369**

***NOW-FAMOUS***

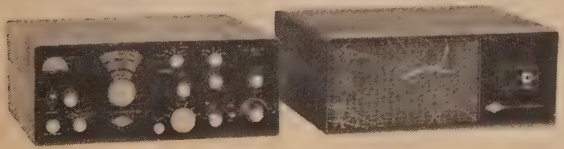
### G-76 TRANSCEIVER BY GONSET —

A smooth working combo separately tunable with powerful 100 watt AM transmitter, sensitive dual-conversion receiver ▪ two-way operation on 80, 40, 20, 15, 10 and 6 meters ▪ mounts easily in car or use elsewhere with matching AC power supply and speaker assembly ▪ Transistorized DC supply is separate ▪

G-76 less power supply and speaker, #3338..... **$451.32**

G-76 12V DC power supply (neg. ground), #3350.... **$157.51**

G-76 power supply for 117V AC w/speaker, #3349.. **$157.51**



### TELETYPE PAGE PRINTERS REBUILT BY ALLTRONICS-HOWARD—

most popular teletype machine among amateurs. Equipped with synch. motor for 110-120 VAC 60 cycles. Cover refinished...all units thoroughly tested mechanically and electrically.

Model 15 with holding magnet, keyboard ..... **$250**

Model 15 with holding magnet, keyboard, automatic carriage return-line feed **$370**

Model 28 specially equipped Teleprinter ..... **$750**

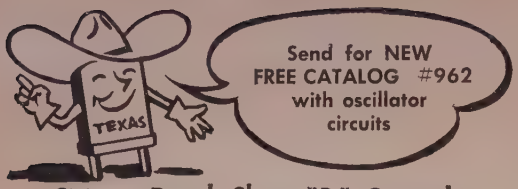
FOR FURTHER INFORMATION WRITE TO:

**HARVEY RADIO CO., INC.**

**103 West 43rd Street, New York 36, N. Y.** 1 Block from Times Square / JUdson 2-1500

sit our new subsidiary, FEDERAL ELECTRONICS, INC., Vestal, N.Y. for all your industrial needs.

For further information, check number 26, on page 128




## Citizen Band Class "D" Crystals

**CITIZEN BAND CLASS "D" CRYSTALS**

3rd overtone — .005% tolerance — to meet all FCC requirements. Hermetically sealed HC6/U holders. ½" pin spacing. .050 pins. (Add 15c per crystal for .093 pins). **$2.95 EACH**

All 23 megacycle frequencies in stock: 26.965, 26.975, 26.985, 27.005, 27.015, 27.025, 27.035, 27.055, 27.065, 27.075, 27.085, 27.105, 27.115, 27.125, 27.135, 27.155, 27.165, 27.175, 27.185, 27.205, 27.215, 27.225, 27.255.

Matched crystal sets for ALL CB units (Specify equipment make and model numbers) ..... **$5.90** per set

**CRYSTALS IN HC6/U HOLDERS**

**SEALED OVERTONE** — .486 pin spacing — .050 diameter — .005% tolerance
15 to 30 MC ..... **$3.85** ea.
30 to 45 MC ..... **$4.10** ea.
45 to 60 MC ..... **$4.50** ea.

**FUNDAMENTAL FREQ. SEALED** — From 1400 KC to 2000 KC .005% tolerance ..... **$5.00** ea.
From 2000 KC to 10,000 KC, any frequency, .005% tolerance ..... **$3.50** ea.

**RADIO CONTROL** — Specify frequency. .05 pins spaced ½" (Add 15c for .093 pins). ..... **$2.95** ea.

**QUARTZ CRYSTALS FOR EVERY SERVICE**

All crystals made from Grade "A" imported quartz—ground and etched to exact frequencies. Unconditionally guaranteed! Supplied in:

**FT-243 holders** — Pin spacing ½" Pin diameter .093
**MC-7 holders** — Pin spacing ¾" Pin diameter .125
**CRIA/AR holders** — Pin spacing ½" Pin diameter .125
**FT-171 holders** — Pin spacing ¾" Banana pins

**MADE TO ORDER CRYSTALS . . . Specify holder wanted**

1001 KC to 1600 KC: .005% tolerance ..... **$4.50** ea.
1601 KC to 2500 KC: .005% tolerance ..... **$2.75** ea.
2501 KC to 9000 KC: .005% tolerance ..... **$2.50** ea.
9001 KC to 11,000 KC: .005% tolerance ..... **$3.00** ea.

**Amateur, Novice, Technician Band Crystals**

.01% Tolerance . . . **$1.50 ea.** — 80 meters (3701-3749 KC) 40 meters (7152-7198 KC), 15 meters (7034-7082 KC), 6 meters (8335-8650 KC) within 1 KC

FT-241 Lattice Crystals in all frequencies from 370 KC to 540 KC (oll except 455 KC and 500 KC) ..... **50c ea.** Pin spacing ½" Pin diameter .093

Matched pairs — 15 cycles **$2.50** per pair

200 KC Crystals, **$2.00 ea.**; 455 KC Crystals, **$1.25 ea.**; 500 KC Crystals, **$1.25 ea.**; 100 KC Frequency Standard Crystals in HC6/U holders **$4.50 ea.**; Socket for FT-243 Crystal **15c ea.**; Dual Socket for FT-243 Crystals, **15c ea.**; Sockets for MC-7 and FT-171 Crystals **25c ea.**; Ceramic Socket for HC6/U Crystals **20c ea.**

**ENGINEERING SAMPLES** and small quantities for prototypes now made at either Chicago or Fort Myers plants with 24 hour service. IN CHICAGO, PHONE GLadstone 3-3555

**IF YOUR PARTS DEALER DOESN'T STOCK** Texas Crystals, order direct and send us his name.

**TERMS:** All items subject to prior sale and change of price without notice. All crystal orders must be accompanied by check, money order or cash with payment in full.

**RUSH YOUR ORDER NOW TO**

**TEXAS CRYSTALS**

Dept. CQ-12 **Div. of Whitehall Electronics Corp.**
**1000 Crystal Drive, Fort Myers, Florida** Phone WE 6-2100

**FOR SHIPMENT VIA FIRST CLASS MAIL AT NO EXTRA COST ATTACH THIS ADVT. TO YOUR ORDER!**

For further information, check number 28, on page 128


changed to 20 meters and continued to tell statesiders of my experience until 1:30 A.M. local time.

Next morning WWVH was sending a normal 5 on 15 mc, but conditions were very poor from then until my last day of operation July 11th.

My total number of QSOs was 1,800 on s.s.b. and c.w. on four bands, 80, 40, 20 and 15.

On July 11th all equipment was finally packed and addressed back to Cal, W4ANE. At 0030 GMT just at dusk I reluctantly boarded the DC-4 and said farewell to a tropical paradise where Liberty, Equality, and Fraternity really exist.

On July 12th I returned to New Caledonia where I was again met by Raoul, FK8AU. Five delightful days were spent with Raoul and his family at a coffee plantation on the northeast coast of the island.

### Fiji Island

July 18th I boarded a DC-8 jet for Fiji where I was happy to spend one week. I stayed with VR2EB, Joe, in Suva and I also met VR2AP, VR2BC, VR2BS, VR2BZ and VR2DI. At Nandi VR2DS, VR2DQ and VR2EH were visited. Also at Nandi I operated from the Collins S-line equipment in the *Mercury* space trailer using the call VR2DS. Conditions at this time were once again very unstable.

July 26th once again and for the last time I packed everything and boarded the giant 707 jet on my last leg of the flight home. The great adventure was over with over 3,000 QSOs from the world over. My thanks to all who assisted and especially to Cal, W4ANE, who was my stateside anchor man. ■

## Space [*from page 77*]

Demonstrated first at the 1962 International Convention of the Institute of Radio Engineers, the OSCAR satellite has been seen by tens of thousands of people in this country, Canada, Finland and England.

During this past summer, the model satellite was loaned to the Finnish Radio Amateur Society (SRAL) for exhibit in Finland. Following are excerpts received from "Nick" Lassiter, OH2XZ, describing the enthusiastic reception OSCAR received in Finland.

"The OSCAR model arrived by air on July 16. A press, radio and TV conference was arranged on the 17th in Stockman's department store in downtown Helsinki, where the satellite was put on demonstration by the SRAL.

"Twelve newspapers and two magazines sent reporters and photographers. Both Helsinki television stations also sent representatives, as well as the Finnish Radio. The TV stations featured pictures of OSCAR and interviews with Finnish radio amateurs who participated in the project on the evening of the 17th.

"Response and interest in OSCAR among Finns has been amazing, to say the least. Everyone I have spoken to recently has heard of OSCAR and knows that Finnish radio amateurs played a part in the project".

The OSCAR model satellite is available for exhibition on a scheduled basis. Information, and requests for the satellite should be addressed to the ARRL, 38 La Salle Road, West Hartford, Conn.

Here's a special message from the Editor relayed from all corners of outer space: MERRY CHRISTMAS AND A HAPPY NEW YEAR TO ALL.

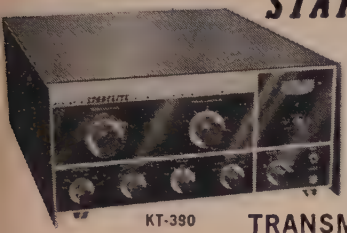
73, George, W3ASK

# LAFAYETTE RADIO

## SMASHING VALUES! TOP DESIGN!

MADE IN U.S.A.

### STARFLITE



KT-390

90 WATT PHONE and CW TRANSMITTER KIT

*COMPARE QUALITY!*
*COMPARE PRICE!*

**79.50**

NO MONEY DOWN

• 90 Watts Phone or CW on 80 Thru 10 Meters • Built-in 3-Section Low-Pass Filter • Clear, Chirpless Grid Block Keying

Dollar for dollar you can't beat this new Lafayette Starflite transmitter. Easy to build and operate, it glistens with quality and performance all-over. Features in addition to those listed above: 5 crystal positions and provisions for external, VFO, illuminated edgewise panel meter and pin-net work output for proper antenna match. Buy one now — we know you'll be satisfied with it.

### THE LAFAYETTE HE-30

Professional Quality Communications Receiver

**99.95**

NO MONEY DOWN

• TUNES 550 KCS TO 30 MCS IN FOUR BANDS • BUILT-IN Q-MULTIPLIER FOR CROWDED PHONE OPERATION • CALIBRATED ELECTRICAL BANDSPREAD ON AMATEUR BANDS 80 THRU 10 METERS • STABLE OSCILLATOR AND BFO FOR CLEAR CW AND SSB RECEPTION • BUILT-IN EDGEWISE S-METER

Sensitivity is 1.0 microvolt for 10 db. Signal to Noise ratio. Selectivity is ± 0.8 KCS at —6db with Q-MULTIPLIER. TUBES: 6BA6—RF Amp, 6BE6 Mixer, 6BE6 OSC., 6AV6 Q-Multiplier—BFO, 2-6BA6 IF Amp., 6AV6 Det-AF Amp. ANL, 6AQ5-Audio output, 5Y3 Rectifier.

### NEW LAFAYETTE HE-50A DELUXE 10-METER TRANSCEIVER

MADE IN U.S.A.

**114.95**

NO MONEY DOWN

- Highly Sensitive Superheterodyne Receiver Section for 28-29.7 Mc
- Effective Series Gate Noise Limiter
- 3-Stage, 12-Watt Transmitter with 2E26 Final
- Illuminated Panel Meter for Plate Current and "S" Readings
- Pi-Network Transmitter Output
- Built-in 117 VAC and 12 VDC Power Supplies
- Push-To-Talk Ceramic Microphone

Provides maximum convenience and flexibility in either mobile or fixed operation.

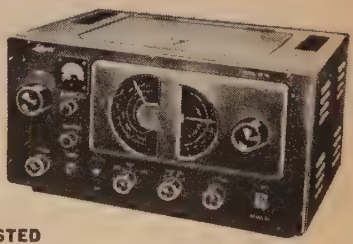
LAFAYETTE HE-45A 6-METER TRANSCEIVER

Similar to above except for 6 meter operation.....114.95

### TOP VALUE COMMUNICATION RECEIVER

KT-200 in Kit Form **64.50**

HE-10 **79.95** WIRED AND TESTED



• SUPERHET CIRCUIT UTILIZING 8 TUBES AND RECTIFIER TUBE • BUILT-IN "S" METER WITH ADJUSTMENT CONTROL • FULL COVERAGE 80-10 METERS • COVERS 455KC TO 31 MC • VARIABLE BFO AND RF GAIN CONTROLS • SWITCHABLE AVC AND AUTOMATIC NOISE LIMITER

The Communications Receiver that meets every amateur need—available in easy-to-assemble kit form. Signal to noise ratio is 10 db at 3.5 MC with 1.25 microvolt signal. Selectivity is —60 db at 10 kc, image reflection is —40 db at 3 MC. Tubes: 3—6BD6, 2—6BE6, 2—6AV6, 1—6AR5, 1—5Y3.

## LAFAYETTE RADIO ELECTRONICS

| | | | | |
|---|---|---|---|---|
| SYOSSET | JAMAICA | NEW YORK | BRONX | NEWARK |
| PARAMUS | PLAINFIELD | SCARSDALE | NATICK | BOSTON |

**FREE!**

CUT OUT PASTE ON CARD

LAFAYETTE RADIO DEPT. CL-2
P.O. BOX 10, Syosset, N.Y.

*Send me the FREE 388 Page 1963 Catalog 630*

Name .....

Address .....

City .....Zone..... State.....

For further information, check number 33, on page 128

hy-gain
VERTICALS
*World Famous for Quality and Performance*

**The All NEW Model 18V... for 10 to 80 Meters**

Here's a low-cost, highly efficient, 18 ft. vertical that can be tuned to any band—10 thru 80 meters—by a simple adjustment of the feed point on the matching base inductor. Designed to be fed with 52 ohm coax, the 18V is amazingly efficient for DX or local contacts. Self-supporting, this radiator which will survive winds up to 50 MPH, may be quickly installed on a short 1⅝" mast driven in the ground. It is also adaptable to roof or tower mounting. Highly portable—knocks down to overall length of 5 ft. A tremendous buy in an antenna with multi-band capability. Priced at **$16.95**

**TRAP VERTICALS**

- **Automatic Band Switching**
- **Exclusive Hy-Gain Slim Traps**

**Model 14 AVS... for 40 thru 10 Meters**

The world's most popular multi-band, omni-directional antenna. Self-supporting and completely factory pretuned to maintain an SWR of 2:1 or less across the entirety of each band. The 14 AVS features a low angle DX radiation pattern. Thoroughly weatherproof. May be roof top or ground mounted. Height: 21'. Wt.: 10 lbs.

Realistically Priced at ..... **$29.95**
Model 14RMK Roof Mounting Kit ..... **$11.95**
Model LC80 Loading Coil for 80 M use ..... **$ 7.95**

**Model 12 AVS... for 20, 15 and 10 Meters**

Companion to the Model 14 AVS... for 10-20 Meters. Completely self-supporting and factory pretuned with SWR 2:1 or less. Height: 13.5 ft. Wt.: 9 lbs.

Priced at ..... **$21.95**
Model 12RMK Roof Mounting Kit .. **$ 9.50**

**SEE THEM TODAY AT ANY ONE OF OUR SIX CONVENIENT LOCATIONS**

C & G ELECTRONICS CO.

Seattle, Washington
2221 3rd Ave.

Olympia, Washington
318 No. Capitol Way

Tacoma, Washington
2502 Jefferson Ave.

Bremerton, Washington
1301 Pacific Ave.

Aberdeen, Washington
510 West Wishkah

Centralia, Washington
217 So. Tower

**FEATURING THE NORTHWEST'S LARGEST, MOST COMPLETE INVENTORY OF HY-GAIN PRODUCTS**

For further information, check number 35, on page 128

## The "Ten-Verter" [*from page 42*]

audio signal leads, mechanically sound wiring and mounting for components in the h.f. oscillators and b.f.o., *etc.*

The alignment can easily be accomplished in the following order. Get both local oscillators working on the prescribed frequencies and then line up the i.f. string. The S-meter can be used as a satisfactory output indicator. The r.f. circuit can best be aligned by the use of received signals.

### Results

With any sort of a good converter this will make a fine v.h.f. converter tuner, thus releasing the brand X receiver for regular low frequency work.

If your favorite converter has a lower frequency i.f., you may be troubled with i.f. feedthrough. If so, you might consider changing your converter to the higher i.f. frequency thus eliminating the feedthrough and permitting its use with the "Tenverter." ■

## RTTY [*from page 69*]

are made by soldering directly to their bases. One end of the box mounts a slide-type on-off switch $S_1$, and the other end mounts an ordinary phone jack, insulated from the box, for connection to the diode keyer of the a.f.s.k. oscillator with a patch cord. That's all there is to this very useful piece of test equipment for an RTTY station.

### Dot Generator Use

Someone is going to ask, "What good is this if you can key only an a.f.s.k. oscillator?" Well, we appreciate that the newcomer RTTYer usually begins RTTY operation by keying the f.s.k oscillator *directly* by the keyboard of the machine, getting local copy by picking up his own signal off the air. The experienced RTTYer soon realizes that this kind of set-up is not the most ideal or flexible. (It's not ideal because direct keying results in emitting a signal full of transients.) Invariably he goes to some form of station control system such as that shown in Fig. 5.2a1 on page 133 of the *New RTTY Handbook* where the keyboard keys an a.f.s.k. oscillator which is fed through the converter which then keys the f.s.k. oscillator, either electronically or via a polar relay.

Operation of the bias checking device described above is so simple it hardly needs to be described. As we said, the output of the W2JAV Dot Generator is patched to the a.f.s.k. oscillator and turned on. The RATE pot can be set somewhere near the middle of its range. Listen to the output of the a.f.s.k. oscillator. If the pilot lamps on the Dot Generator are flashing properly and you don't hear the signal being keyed, flip the reversing switch on the Dot Generator. The a.f.s.k. oscillator should now be keyed.

Now, you can use your 'scope to examine the square wave pulses throughout your entire system. Start at the output of the a.f.s.k. oscillator itself. If your unit passes this test, feed its output into the converter and connect he 'scope across a 100 to 180 ohm 1 watt resistor substituted for the selector magnets of the machine. The picture should be real enlightening. If you get a reasonable facsimile of the same square wave at the output as you put in, you will be most fortunate. Check carefully to see if the *mark* pulses are the same length as the *space* pulses. If they are not, you have telegraph bias. Make adjustments in the various components of your system as you watch the 'scope.

### On the Bands

W1OHE of Norwalk, seems to be the sole representative for Connecticut (October) on the East Coast RTTY

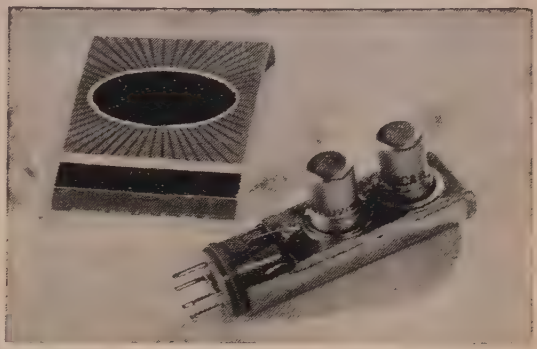
# BOOST RECEIVER SENSITIVITY TO 10 TIMES!

*The NEW Raytronics NUVISTAPLUG gives up to 25 db gain when inserted in the RF amplifier tube socket of any receiver (CB, Ham, TV, FM, etc.). Cuts noise figure from about 6 db to less than 3 db. No wiring or circuit changes! Replaces directly in socket of any 7 pin pentode RF amplifier. Warrantied for 90 days! When ordering, state type of tube the NUVISTAPLUG will replace (6AU6, 12AU6, 12BA6, 6CB6, 6BZ6, 6DC6, 6DB6, etc.). Money back guarantee if you are not satisfied.*

**ONLY $17.95**

**postpaid**
**(No C.O.D.'s)**

See page 26 Sept. CQ for a review of the NUVISTAPLUG.



**RAYTRONICS**
**% CQ MAGAZINE**
**300 West 43rd Street**
**New York 36, N. Y.**
**N.Y.C. Residents add 3% City Sales Tax**

---

Your personal attention is a "must" at WRL. Our 18 hams are at your service day or nite. Write, phone, or wire.

**Leo I. Meyerson, WØGFQ**

# WRL SELLS TO YOU DIRECT

**Postpaid!* $15.95**

## "MULTI-PAK" PSA-63

**Universal AC P.S.** Silicon rectifiers. Dual HV 600V/300V @ 300Ma, 210W. Max. Bias 0-90 VAC. Also available customized for Swan, G76, etc. Wt. 15 lbs. **$24.95** Kit. Wired $39.95.

## TECH-CEIVER 6A

**6 Meter Transceiver—Mobile—Fixed—Compact.** Size; 5"H, 9¼"W, 6"D. 5W. input with 8Mc xtals, PTT. Rec. ½uv, tunes 49-54 Mc, AVC, ANL, stable, selective, speaker. Wt. 9 lbs. Less P.S. Kit $39.95 **$39.95**

## PREAMPLIFIER DB-68

**Wired Preselector — 6-80 Meters.** 6 triode tube sections for average 24DB gain. Tunable, built-in 115VAC P.S., coax or twin lead, illuminated dial. 6¾x6-5/8x7½". Sh. wt. 10 lbs. 1 yr. parts warranty. WRL Import. **$39.95**

## ANTENNA TUNNER

MK. II
WVG

**Mini-Matcher MM-100** 100 watt Kit. Matches end fed wires ½ wave or multiplies to 50-75 ohm coax. Xmttr. output. Steel case, 4x5x4". 150 watts SB, 100CW, 75AM. Wt. 3 lbs. **$10.95**

**All Band Vertical** - Self supporting. Tunes to any amateur band 10 through 80 meters. Designed to be fed with 52 ohm coaxial cable. Maximum power 1KW AM, 2KW PEP. Overall height 18 ft. ***Postpaid (Continental USA)**

WRITE FOR OUR FREE FLYER & LIST OF OVER 1,000 PIECES OF QUALITY RECONDITIONED EQUIPMENT - TERMS - TRADES

**WRL** WORLD RADIO LABORATORIES, Inc.
3415 W. B'dway • Council Bluffs, Ia.

Leo, sell me direct ☐ Deskit ☐ Q Multiplier ☐ On-The-Air Box ☐ Multi-Pak P.S. ☐ Tech-Ceiver 6A ☐ Add to my Charg-A-Plan ☐ Check enclosed ☐ Additional information on _____. FOB WRL C 12

Name _____ Call _____

Address _____

City _____ State _____

For further information, check number 51, on page 128

## INFORMATION REQUIRED FOR A TIME PAYMENT PURCHASE AT AMATEUR ELECTRONIC SUPPLY

**(see our ads in this magazine on pages 84, 109, 113, 117, 121)**

Even if you are not ready to make a purchase on credit today, send me the following information on a separate piece of paper. Do not put it in the body of a letter. If you have a message to send us enclose it with the credit application on a separate piece of paper. Once your credit has been ok'ed you will receive an attractive card showing that you are a preferred credit customer. All at no cost to you. List the following information on a separate piece of paper very carefully, accurately, and complete in every detail for quick credit approval:

1. Your full name. Your age. Your Driver's License Number and state in which it is issued.
2. Your wife's name (if any). Her age. Number of children (if any) and their ages.
3. Your complete home address. How long have you lived there? Your telephone number, or nearest phone where you can be reached.
4. List your previous address. How long were you there?
5. If you rent, show the amount of payment. Also name, address, and phone number of landlord.
6. If you own your own home, show the amount of payment (if any). The mortgage holders name, address, and phone number.
7. Show name of employer, his address, and phone number. Your occupation. How long you have been there. Salary by the week.
8. Show previous employer, his address, and how long there.
9. If your wife is employed, show name of employer, address and phone number. Her occupation, and weekly salary.
10. If own a car, show year and model. If it is financed, show by whom and their address.
11. If you own your furniture, state so. If it is being financed, show by whom and their address.
12. List the names and addresses of banks with whom you do business with.
13. List at least five credit references, giving the complete street address, city and state. If you owe anything to these people, show the amount owed, and briefly the items purchased.
14. List at least two relatives and one friend not living with you.
15. Indicate the amount of credit desired and the length of time you desire credit. For instance, $1,000, for 36 months.

**Send the above information to speed a time payment purchase to:**

**AMATEUR ELECTRONIC SUPPLY**

**3832 W. LISBON, MILWAUKEE 8, WISCONSIN**


Net. WA2LKF of Hammonton, N. J., is on 80. W4IAA/2 operates from Rome, N. Y. WB2CVN, ex-WØPHM/V01, is poking a good signal into California on 20, according to W6AEE. WA2QGJ is also on 20. W2DFX of Center Moriches, Long Island, is on 80. W3NQC of Baltimore, Maryland, has been looking north with his ten element beam on 2 meters, but hasn't heard any a.f.s.k. (*What we need is a "national" RTTY frequency for 2 meters!*)

K4SYB of Alexandria, Va., reports considerable a.f.s.k. activity on 146.8 mc a.m. in the Washington, D. C., area. W4PAY, the Fairfax, Va., county Red Cross station is equipped for 80 or 40, with a 6 or 2 meter link to the Red Cross building in Washington, D. C. Air Force MARS is cooperating. K5CKS of Cushing, Oklahoma, is on 20. K5CHC reports the following activity in the New Orleans, La., area: W5JGV is on all bands with an FRA converter and a k.w. K5CME uses a Viking kw and a HyGain 20/40 beam. W5MAA built a transistor TU. All are on 6 meter a.f.s.k., too.

K6ESZ and K6ZBL are transmitting NCARTS bulletins on the first and third Thursdays at 7:00 P.M. PST on 3620 kc and 146.475 mc. K8VXX of Midland, Michigan, is on with a new Valiant II, a Model 15, and a "Chemical City TU." Don also is looking for a Model 14 typing reperf. (*see W9GRW*) WØFTD of Independence, Mo., is on 146.94 mc f.m. WØTTN, also of Independence, is looking for f.m. gear.

VE3DTY and VE3FR are on 80 as usual. G3CQE and I1RIF continue to provide solid European contacts on 20.

### Comments

As the year draws to a close, we usually sit back and reflect upon the progress and the increase in activity the past year. As ever, activity is steadily increasing as more and more machines are becoming available. RTTYers are *still* having to modify their store-bought transmitters for f.s.k. (Notable exception: Hammarlund) as the "big-guns" in transmitter-makers refuse to build in this feature. Commerically built converters, at a reasonable price, *still* cannot be bought over the counter. So, I guess RTTY is *still* the last frontier of amateur radio, where it is necessary to build and adjust your own gear. Which, by the way, is not a bad thing. It helps us to justify our licenses, at least, and incidentally helps us to learn something.

Merry Christmas and a Happy New Year to all!

73, Byron, W2JTP

## Novice [*from page 67*]

formative column each month for *CQ*. I enjoy your columns because of your knack of keeping them simple for the Novice to understand.

"I just wanted to let you know that once again there will be some Novice activity from Guam Island. I received my license on 20 July, 1962 and hope to have a small rig on the air by the time this letter reaches you. To my knowledge, I am the only Novice on the Island at present but should be joined shortly by at least one more. The station here will be Hallicrafter's SX-100, a homebrew transmitter using a 6AG7 and a 6146, a 15 meter dipole on a 40 foot tower and a doublet for 40 meters. I will operate evenings from 10:00 to 13:00 hours G.M.T. and on Fridays and Saturdays from 10:00 to ????. Any Novices or Generals desiring to contact Guam should be prepared for a good ragchew, I won't let them get away with just a signal report, hi. I promise to QSL 100% even if I have to bum nickels from my kids to pay for the postage. I hope the other Novices will

[*Continued on page 116*]

# $5.00 DOWN ...UP TO 3 YEARS TO PAY

Terry W9DIA

# HALLICRAFTERS New SX-117 RECEIVER

## — and just $5.00 down and $13.54 a month delivers the exciting new Hallicrafters SX-117 to you — 3 years to pay!

Exceptionally versatile and compact triple-conversion, superheterodyne communication-type receiver. V.F.O. can be used as crystal locked oscillator; **Selectivity:** Variable in 3 steps, 0.5-2.5-5.0 kc. Crystal-controlled 1st and 3rd oscillators. Selectable sidebands, constant tuning rate. **Sensitivity:** less than 1 mv. on AM, less than ½ mv. on SSB/CW. **T-notch** for up to 50 db. attenuation to unwated heterodyne in I.F. pass band. I.F. type noise limiter. Audio inverse feedback. Crystals provided for 3.5—4.0, 7.0—7.5, 14.0—14.5, 21.0—21.5, 28.5—29 mc. Four addt'l, crystal pos. for 500 kc. segments between 85 kc. and 30 mc., 100 kc. crystal calibrator included. Size: 15" x 17⅛" x 13". Net wt. 18 lb. **Amateur net price: $379.95**

**HA-10 Low Freq. tuner** adapts SX-117 for 85 kc.—3 mc. $24.95

## NEW HALLICRAFTERS EQUIPMENT

| | Amateur Net Price | Monthly Payments | | Amateur Net Price | Monthly Payments |
|---|---|---|---|---|---|
| CRX-1 Recvr. | $ 99.95 | $ 3.42 | R-47 Spkr. | 12.95 | .29 |
| CRX-2 Recvr. | 109.95 | 3.79 | R-48 Spkr. | 19.95 | .54 |
| CRX-3 Recvr. | 94.95 | 3.24 | S-108 Recvr. | 139.95 | 4.87 |
| FPM-200 Mobile | 2,650.00 | 95.51 | S-118 Recvr. | 99.95 | 3.42 |
| HA-1 Keyer | 79.95 | 2.70 | S-119 Recvr. | 49.95 | 1.62 |
| HA-2 Transvtr. | 349.50 | 12.44 | S-119K | 39.95 | 1.26 |
| HA-5 VFO | 79.95 | 2.70 | S-120 Recvr. | 69.95 | 2.35 |
| HA-6 Transvtr. | 349.50 | 12.44 | SX-62A Recvr. | 430.00 | 14.08 |
| HA-10 Tuner | 24.95 | .76 | SX-100 Recvr. | 325.00 | 11.56 |
| HT-32B Xmtr. | 725.00 | 26.00 | SX-101A Recvr. | 445.00 | 15.89 |
| HT-33B Xmtr. | 995.00 | 35.75 | SX-110 Recvr. | 169.95 | 5.86 |
| HT-37 Xmtr. | 495.00 | 17.69 | SX-111 Recvr. | 279.50 | 9.91 |
| HT-40 Xmtr. | 109.95 | 3.79 | SX-115 Recvr. | 599.95 | 21.48 |
| HT-40K Xmtr. | 89.95 | 3.07 | SX-117 Recvr. | 379.95 | 13.54 |
| HT-41 KW Lin | 395.00 | 14.08 | SX-140 Recvr. | 124.95 | 4.33 |
| P-26 Supr. | 99.50 | 3.41 | SX-140K Recvr. | 104.95 | 3.61 |

## RECONDITIONED HALLICRAFTERS GEAR

| | | | |
|---|---|---|---|
| HA-5 VFO | $ 59.00 | SX-43 REC. | 89.00 |
| HT-18 VFO | 39.00 | SX-71 REC. | 119.00 |
| HT-20 XMTR. | 99.00 | S-76 REC. | 79.00 |
| SX-28 REC. | 99.00 | S-77A REC. | 49.00 |
| HT-31 Linear | 129.00 | S-95 REC. | 39.00 |
| HT-32 XMTR. | 369.00 | SX-96 REC. | 159.00 |
| HT-32A XMTR. | 429.00 | SX-99 REC. | 89.00 |
| HT-33A Linear | 399.00 | SX-100 REC. | 189.00 |
| HT-37 XMTR. | 349.00 | SX-101A REC. | 289.00 |
| S-38E REC. | 34.00 | S-106 REC. | 39.00 |
| HT-40 XMTR. | 64.00 | SX-110 REC. | 119.00 |
| S-40 REC. | 49.00 | SX-111 REC. | 179.00 |
| S-40A REC. | 59.00 | S-119 REC. | 29.00 |
| S-40B REC. | 69.00 | S-120 REC. | 39.00 |
| S-41W REC. | 39.00 | SX-140 REC. | 79.00 |
| SX-42 REC. | 139.00 | | |

### STAY ON THE AIR PLAN

Yes—Now you can enjoy your new Hallicrafters SX-117 or any other new Hallicrafters equipment without going off the air. You need not ship your trade-in in to us until you receive our shipment, and make sure that your new merchandise is in good working condition.

### INFORMATION ON FINANCING

Only $5.00 down is required for any New Hallicrafters Equipment. 10% is required for reconditioned equipment. Payments shown on new equipment are for a 36 month plan. A $60 order for either new or used equipment, may be financed up to one year, two years on a $120 order, or three years on $180 order. If you do not already have one of our Credit Cards, to speed your order you should supply us with the credit information when you send in your down payment. See page 108 of this magazine. Persons purchasing on our time payment plan must be of 21 years of age and regularly employed. Service men with APO addresses with good credit ratings, accepted.

## AMATEUR ELECTRONIC SUPPLY

**THREE STORES TO SERVE YOU**

**Please send mail orders to Milwaukee Store**

**3832 West Lisbon Ave., Milwaukee 8, Wis. • PHONE WEST 3-3262**

**CHICAGO 31, ILL.**
6450 Milwaukee Ave.,
PHONE RO 3-1030

**ORLANDO, FLORIDA**
23 Azalea Park
Shopping Center

K-122

**Amateur Electronic Supply — Mail Order Dept.**
**3832 W. Lisbon Ave., Milwaukee 8, Wisconsin**

Ship me .....

I enclose ..... I will pay the balance in

☐ 1 year ☐ 2 years ☐ 3 years

If new account—enclose credit information—see page 108

I want to buy ..... and want to trade

..... What's your deal?

Name .....

Address .....

City ..... Zone..... State.....

☐ Send reconditioned equipment and sale bulletin.

For further information, check number 38, on page 128

# BARRY'S DECE

## TUBE HEADQUARTERS OF THE WORLD!!!

***Serving Amateurs is our Specialty.***

| | |
|---|---|
| 0A2 | $1.00 |
| 0B2 | .85 |
| 0B3/VR90 | $1.25 |
| 0C3/VR105 | .65 |
| 0G3/85A2 | $2.25 |
| 1N34A/1N120 | .25 |
| 1N69 | .15 |
| 1N1341/341A | $2.25 |
| 2C40 | $6.00 |
| 2C43 | $6.00 |
| 2C51 | $1.25 |
| 2D21 | .65 |
| 2E26 | $2.75 |
| 2G21 | $1.50 |
| 2K25 | $10.00 |
| 2K28 | $21.00 |
| 2N255A | $1.20 |
| 2N404 | .35 |
| 2X2 | .20 |
| 3AL5 | .50 |
| 3B25 | $2.95 |
| 3B28 | $2.50 |
| 3CX100A5 | $9.90 |
| 4-65A | $9.00 |
| 4-125A | $24.00 |
| 4-250A | $35.00 |
| 4-400A | $37.50 |
| 4-1000A | $95.00 |
| 4CX250B | $33.00 |
| 4CX300A | $44.00 |
| 4CX300A socket (SK-710) | $12.90 |
| 4E27 | $7.50 |
| 4H4C | $1.80 |
| 4X150A | $11.50 |
| 4X150D | $11.00 |
| 4X250B | $32.00 |
| 4CX250B | $38.00 |
| 5BP1 | $5.75 |
| 5BP4 | $6.50 |
| 5R4GY | $1.75 |
| 5U4GB | .75 |
| 6AF4/6AF4A | $1.35 |
| 6AG5 | .75 |
| 6AG7 | $1.00 |
| 6AJ5 | $1.00 |
| 6AK4 | .60 |
| 6AK5 | $1.10 |
| 6AK5W/5654 | $1.20 |
| 6AL5W | .75 |
| 6AQ5W/6005 | $1.25 |
| 6AR6 | $1.20 |
| 6AS7G | $2.50 |
| 6CA7/EL34 | $1.75 |
| 6CL6 | $1.30 |
| 6CW4 | $1.90 |
| 6DJ8 | $2.15 |
| 6J4/6J4WA | $3.00 |
| 6J6 | .75 |
| 6L6G/GA | $1.35 |
| 6SN7GT | .90 |
| 6V6GT | .75 |
| 6V6M | $1.65 |
| -0 | .75 |
| 12AT7 | $1.05 |
| 12AT7WA/6201 | $1.50 |
| 12AX7/ECC83 | .90 |
| 12AY7 | $1.20 |
| 12BY7 | $1.05 |
| 12SG7 | .80 |
| 1616 | .85 |
| T20 | $1.75 |
| 21AXP22A | $88.00 |
| T21 | $2.50 |
| EL34/6CA7 | $1.75 |
| 35TG | $3.75 |
| TZ-40 | $6.50 |
| 45 | $1.25 |
| 46 | $1.00 |
| 47 | $2.00 |
| T55 | $4.75 |
| 57 | $1.40 |
| 58 | $1.10 |
| 59 | $1.35 |
| 80 | $1.00 |
| 83 | $1.50 |
| 100TH | $14.00 |
| 211 | $1.75 |
| D250 (Ohmite Dummy Load) | $2.90 |
| 404A/5847 | $3.90 |
| WE416B | $16.95 |
| 417A/5842 | $6.90 |
| 450TL | $28.00 |
| 803 | $6.50 |
| 806 | $6.50 |
| 807 | $1.75 |
| 807W/5933 | $2.75 |
| 808 | $1.00 |
| 809 | $4.95 |
| SK-810 (Elmac Socket for 4CX1000A) | $30.00 |
| 811A | $3.75 |
| 812A | $3.75 |
| 813 | $14.95 |
| 814 | $4.95 |
| 815 | $3.40 |
| 816 | $2.50 |
| 832A | $6.95 |
| 833A | $44.00 |
| 866A | $1.50 |
| 866 Jr. | $1.50 |
| 872A | $4.75 |
| 884 | $1.25 |
| 885 | $1.15 |
| 918 | $1.50 |
| 1619 | .30 |
| 1624 | $1.20 |
| 1625 | .35 |
| 2050 | $1.50 |
| 5514 | $5.95 |
| 5517 | .60 |
| 5642 | .95 |
| 5670 | $1.00 |
| 5687 | $1.20 |
| 5691 | $4.50 |
| 5692 | $3.75 |
| 5693 | $3.50 |
| 5696 | $1.90 |
| 5718 | .95 |
| 5719 | .80 |
| 5725/6AS6W | $1.25 |
| 5726/6AL5W | .75 |
| 5727/2D21W | $1.00 |
| 5749/6BA6W | .95 |
| 5750/6BE6W | $2.70 |
| 5751 | $1.25 |
| 5763 | $1.50 |
| 5814/5814A | $1.25 |
| 5823 | .80 |
| 5829 | $1.00 |
| 5840 | $1.25 |
| 5842/417A | $6.90 |
| 5847/404A | $3.90 |
| 5879 | $1.20 |
| 5881 | $1.80 |
| 5894 | $21.00 |
| 5896 | $1.00 |
| 5915 | $1.00 |
| 5963 | $1.05 |
| 5965 | .95 |
| 5998 | $2.50 |
| 6004 | .30 |
| 6072 | $1.20 |
| 6073 | $1.00 |
| 6080 | $3.75 |
| 6096 | $1.20 |
| 6111 | $1.90 |
| 6112 | $1.75 |
| 6135 | $1.50 |
| 6136 | $1.15 |
| 6146 | $3.25 |
| 6161 | $45.00 |
| 6201/12AT7WA | $1.50 |
| 6252 | $19.50 |
| 6263 | $9.50 |
| 6264/6264A | $11.00 |
| 6268/9911 | $29.50 |
| 6293 | $5.40 |
| 6350 | $1.75 |
| 6360 | $3.95 |
| 6383 (RCA) | $25.00 |
| 6550 | $4.00 |
| 6550 (Matched Pair per pair | $8.50 |
| 6893 | $3.70 |
| 6922 | $3.25 |
| 6955 (CBS) | $6.50 |
| 7025 | .80 |
| 7034—See 4X150A | |
| 8008 | $5.75 |
| 8013 | $2.95 |
| 8020/GL451 | $4.50 |
| 9001 | .50 |
| 9002 | .70 |
| 9003 | $1.50 |
| 9004 | .25 |
| 9006 | .20 |
| 9902/5868 | $47.50 |
| 9903/5894 | $21.00 |

# MBER SPECIALS

### AMECO . . . BRAND NEW

CN-50K-Deluxe Nuvistor Converter in kit form for 50 Mc. .....$34.95
CN-50W (same as above . . . only wired and tested) .....$49.95
CN-144K-Deluxe Nuvistor Converter in Kit form for 144 Mc. .....$34.95
CN-144W (same as above . . . only wired and tested) .....$49.95
TX-86 90 Watt Transmitter 6 thru 80. Phone & CW (wired) .....$119.95
PS-3 AC Power Supply for TX-86 (wired & tested) .....$44.95
Authorized factory distributor for Ameco Products.

### WESTERN ELECTRIC TUBE TYPE 404-A

These tubes have been laboratory tested and are fully guaranteed. They are designated with the W.E. prototype number F52983. Type F52983 is positively the same and 100% interchangeable with type 404A. Stock up and save at only .....$2.90

### WESTERN ELECTRIC TUBE TYPE 417A

Lab tested okay, and are fully guaranteed. They are designated with the W.E. prototype number F52984. Type F52984 is positively the same and 100% interchangeable with type 417A. Stock up and save at only . .$3.90 each

### RCA HI-FREQ. POWER TRIODE WATER OR FORCED-AIR COOLED. TUBE TYPE NO. 6383

Full input up to 2,000 MC. Fil-6.3VAC at 3.4 amps. Plate Voltage 1500 Max. at 400 Ma. 600 Watts input per tube. 1⅞" Overall Height, 4¼" Overall Diameter. Brand New Original RCA Jan. Cartons. Regular Net $30.00. SUPER SPECIAL .....$25.00

**Unused surplus 35 TG tubes, RF tested OK.** 50 Watt plate dissipation, general purpose triodes. Filament 5 Volts at 4 Amps. Maximum plate voltage 2,000 VDC at 150 Ma. (power output 235 Watts Reg. net price over $20.00) .....$3.75

### RCA PRECISION 500 KC CRYSTAL OSCILLATOR

Accuracy plus or minus 0.0012%. Contains Precision 500 KC crystal, BIAS Labs Crystal Oven. 5840 sub-miniature tube. Hermetically sealed nickel plated rectangular case Mounts in standard 7 pin miniature socket. Requires 6.3 VAC or DC 75 to 100 V.D.C. With Schematic. RCA Type A8838300-1. Size: 4½"H x 1-7/16"W x 1⅛"D. Wt.: 1 lb. Cat. #4-500 ORV. (Orig. Govt. Cost $172.00) Very Special Only .....$5.00

### WESTINGHOUSE TYPE 303C POWER SILICON

18 Amps at 150 Peak. Inverse Volts. A regular $14.00 value for only .....$3.95

### PROP-PITCH MOTOR

We have another lot of the desirable Prop-Pitch Motors suitable for rotating the heaviest Ham or Commercial Rotary Beam. These are the large motors weighing 80 lbs. each net. Packed they will still weigh under the 100 lb. limit for economical motor freight. All in good used condition. (Converted)—$40.00 FOB Georgia. Not converted—(FOB Georgia) $35.00

### COAXIAL CABLE

| Type | Nominal Impedance | Price Per 100' | Price Per 1000' |
|---|---|---|---|
| RG-8/U | 52 Ohms | $8.50 | $80.00 |
| RG-8A/U | 52 Ohms | 12.00 | 115.00 |
| RG-11/U | 72 Ohms | 8.00 | 75.00 |
| RG-11A/U | 72 Ohms | 9.00 | 85.00 |
| RG-58/U | 52 Ohms | 4.50 | 40.00 |
| RG-58A/U | 52 Ohms | 5.00 | 44.00 |
| RG-59/U | 72 Ohms | 4.50 | 40.00 |
| RG-59A/U | 72 Ohms | 5.00 | 44.00 |

### SILICON RECTIFIER

750 Ma/600 PIV . . . W5DX says "By using ten of these in a leg of a full-wave hook-up, I replaced two 866's, did away with a fixed choke, filament xfmr. and two sockets. Gained 600 Volts and ran stone cold. . . . .36¢ each (10) Mounted on Mounting Board, soldered and wired, ready for Hook-Up .....$4.50

### VIBRATOR TRANSFORMER

Output: 500 VDC @ 170 Ma. Also puts out simultaneously 220, 250, or 300 VDC @ 70 Ma. Primaries operate from either 12 VDC or 6 VDC when hooked up as per furnished schematic .....$3.75

### PLATE TRANSFORMER

Operates from 115 or 230 VAC at 50-60 COS. Sec: 3750-0-3750 VAC. Tested at 250 Ma. Oil-filled. 11"H x 7¼"W x 5¼"D. 38 lbs. Packed two to the wooden original case (70 lbs.). The current is incorrectly stenciled on this xfmr. However, unit thoroughly tested and guaranteed for 250 Ma. . . .$35.00 each

### COMPACT 125 WATT MODULATION TRANSFORMER

Pri: 10,000 Ohms Plate to Plate Sec: 4550 Ohms. Has screen winding, 3300 Ohms. Open frame, epoxy impregnated. Winding insulation to ground, 5000 Volts Peak. Dimensions: 3-18"H x 3½"W x 3¼"D. Weight: 3 lbs. Designed for P.P. 4-65 A'S Modulators in airborne XMTR. .....$4.95

### EIMAC SK-710 SOCKET

For 4CX300A. Original boxed.
Brand new .....$12.50

### EIMAC SK-810 SOCKET

New, for 4CX1000A Tube .....$30.00

### EIMAC SK-806 CHIMNEY

New, for 4CX1000A Tube .....$5.50

### EIMAC 4X150A/4010 AIR SYSTEM SOCKET

With built-in By-Pass Capacitors. R/E. A regular $12.00 value for only .....$6.95

### AMATEUR OR CITIZEN'S BAND MOBILE TRANSMITTER

Uses 5618 crystal oscillator into CBS 5516 amplifier. Modern design. Only 7lbs. net weight including built-in 6 V. vibrator power supply. Completely enclosed in aluminum cabinet (5½"H x 7"W x 8"D). Furnished with crystal that doubles near 10 meter band. Will require slight and easy modification for 10 meter operation. A real beauty. With tubes .....$9.95

### 4X150A POWER TETRODE

New Jan. late 1959-1960 product, made by RCA. There are unused, not pullouts. Original net catalogue Price $33.15. Overall size: 2.47"L x 1.65" Diam. Shipping Wt.: 1.6 lbs. Cat. #4X150A. Barry's Price. .$12.50

**Illumitronic** Air Dux: 500 W. plus. Model PI-195-1 .....$5.95

**Illumitronic** Air Dux: 1.KW. Model PI-195-2 $14.50

**G.E.** Plate Xfmr: Pri: 115 or 230 @ 60 CPS. Sec: 3535 VAC @ 2KVA. 40 lbs. .$19.95

**Dow-Key** Coax Relay: 52 Ohms/1 KW/115 VAC. #DK60-G2C .....$15.65

**Dow-Key** In Line Coax Broad Band Pre-Amp: 1.5 thru 30 Mcs. #DKC-RFB . . .$10.75

**Dow-Key** Double Male Connector: #DKF-2 .....$1.25

**Dow-Key** Panel Mount Connector: #DK60-P .....70¢

**Capacitor Sale!!:** 800 Mfd./150 VDC; 1500 Mfd./80 VDC; 2500 Mfd./80 VDC; 3000 Mfd./40 VDC, all $1.00 each. 4000 Mfd./50 W.V. @$1.25; 8000 Mfd./55 W.V. (65V. Peak) .....$2.95

**B & W** Model 850A KW. Pi-Network Inductor .....$35.00

**Clegg 99'er** .....@ $159.50

**Zeus Xmtr.** .....@ $695.00

**Interceptor Recvr.** .....@ $473.00

**Rhodes** Deluxe 1 Hour Bell Timer .....70¢

750 MA/600 PIV Silicon Rectifiers . . . .36¢

Transistor Pwr Supply: 12 VDC/250 VDC/100 Ma. .....$19.90

**In stock! Drake** Low-Pass Filters/**New-Tronics** "Hustler" Antennas and Bumper Mounts.

**Deluxe Thomas & Betts Wire** Welder, with welding run. Complete. Only . . . .$39.00

**1800 PIV/700 Ma. FW** Rectifier/Tube Substitute 4 Prong. Replaces 5Z3, 80, 83, etc., with higher voltage .....$3.10

**1800 PIV/700** Ma. FW Rectifier /Octal base tube substitute. Replaces 5U4, 5V4, 5Z4, etc., with higher voltage .....$3.10

**Hammarlund** Split-Stator 320/320 Mmfd. Xmtg. Capacitor: Deluxe, ceramic insulation. ¼" shaft. Fully meshed spacing: .08" .3" x 4" x 11" .....$4.95

**Electro-Voice** RME6900 SSB/CW/AM Receiver and Matching Speaker. Write for highest trades.

**SALE ON FOLLOWING: Drake 2B; NC-400; Autronic Key; Mosley** Antennas; **Tri-Ex** Towers; **C.D.** Rotator; **Electric-Voice** Mikes; **BC-639** VHF Recvr; **Courier 500** Watt Linear Amplifier; **HQ105TR; SP-600;** Model 80. Sig. Gen.

**WRITE FOR PRICES & DETAILS. COME IN SATURDAYS FROM 10 A.M. TO 2 P.M.**
**Mon. thru Fri.: 9 A.M. to 6 P.M.**
**Free parking on Saturdays**
**Monday thru Friday nominal parking fee at 501 or 557 Broadway**

**BARRY ELECTRONICS** **DEPT. CQ-12**
**512 BROADWAY, NEW YORK 12, N. Y.**
**WALKER 5-7000 AREA CODE: 212**

☐ Enclosed is money order or check and my order. Prices FOB, NYC. Shipments over 20 lbs. will be shipped collect for shipping charges. Less than 20 lbs. include sufficient postage. Any overage will be refunded.
☐ Send copy of "Green Sheet" Catalog. 1962-63
☐ Send information on: .....
☐ I have available for trade-in the following .....

.....

Name .....Title

Company .....

Address .....

City .....State.....

For further information, check number 36, on page 128

# HI-EFF* IS HERE

## with the SATELLITE SSB TRANSCEIVERS

## MOBILE • FIXED • PORTABLE

**HI-EFF* = OUTPUT / INPUT = REALLY NEEDED FEATURES / LOWEST COST HIGHEST GAIN**

### CHECK THESE REALLY NEEDED FEATURES

**WEIGHS ONLY 10 POUNDS**

- "S" METER AND AGC
- UP TO 200 WATTS PEP
  Will drive any linear to 2 KW PEP
- 1 MICROVOLT SENSITIVITY
  For 6 db S/N to noise
- 2.5 KC CRYSTAL LATTICE FILTER
  Up to 40 db unwanted SB suppression
- PUSH TO TALK OPERATION
  Manual or remote
- 16 TO 1 COMMON VFO TUNING RATIO
  Can be read to 1 KC
- 110VAC OR 12 VDC SUPPLIES OPTIONAL

Available for 75, 40, 20 meters. Specify S-20B for 20 meters, S-40B for 40 meters, S-75B for 75 meters. Conversion instructions are included.

HI-EFF* = HIGH EFFICIENCY

Write for Bulletin
SEE YOUR DEALER

**$269.00**

**TRANSCEIVERS, inc**

166 LONG BEACH RD., ISLAND PARK, N.Y.

For further information, check number 50, on page 128

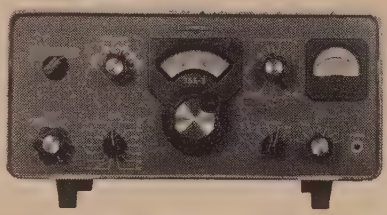
# $5.00 DOWN ...UP TO 3 YEARS TO PAY

# DELIVERS ANY NEW COLLINS EQUIPMENT

| | Amateur Net Price | Per Month |
|---|---|---|
| **TRANSMITTERS** | | |
| 30L-1 Linear Amplifier | $ 520.00 | $18.59 |
| 30S-1 Linear Amplifier | 1,556.00 | 56.00 |
| 32S-3 Transmitter | 750.00 | 26.90 |
| **RECEIVERS** | | |
| 75S-3 Receiver | 650.00 | 24.35 |
| 75S-3A Receiver | 750.00 | 26.90 |
| 51J-4 Receiver | 1,464.00 | 52.69 |
| 51S-1 Receiver | 1,828.00 | 65.83 |
| **VHF CONVERTER** | | |
| 62S-1 VHF Converter | 395.00 | 32.13 |
| **TRANSCEIVERS** | | |
| KWM-2 Transceiver | 1,150.00 | 41.35 |
| KWM-2A Transceiver | 1,250.00 | 44.95 |
| **DUMMY LOAD** | | |
| DL-1 Dummy Load | 58.00 | 1.91 |
| **MOUNTS** | | |
| 351D-2 Mobile Mount (KWM-2) | 120.00 | 4.15 |
| **CARRYING CASE** | | |
| CC-2 Carrying Case | 85.00 | 2.88 |
| CC-3 Carrying Case | 107.00 | 3.68 |
| **POWER SUPPLIES** | | |
| MP-1 14 DC Power Supply | 198.00 | 7.10 |
| PM-2 Portable Power Supply | 150.00 | 5.24 |
| 516F-2 AC Power Supply (32S, KWM-2) | 115.00 | 3.97 |
| **SPEAKERS** | | |
| 312B-3 Speaker (S/Line) | 32.00 | .97 |
| 312B-4 Speaker Console (S/Line, KWM-2) | 195.00 | 7.00 |
| 312B-5 PTO Console (KWM-2) | 350.00 | 12.45 |
| 399C-1 PTO Speaker (KWM-2) | 164.00 | 1.99 |
| **MICROPHONES** | | |
| SM-1 Fixed Station Microphone | 32.00 | .97 |
| SM-2 Fixed Station Microphone | 48.00 | 1.46 |
| MM-1 Mobile Hand Microphone | 25.00 | .76 |
| MM-2 Mobile Boom Microphone/ Earphone | 44.00 | 1.40 |
| **MECHANICAL FILTERS** | | |
| F455Q-5 Mechanical Filter (75S-1) | 52.00 | 1.70 |
| F455Y-40 Mechanical Filter (75S1, 75S3) | 50.60 | 1.64 |
| F455Y-60 Mechanical Filter (75S1, 75S3) | 50.60 | 1.64 |
| **NOVICE ADAPTERS** | | |
| 399B-4 Novice Adapter (32S) | 40.00 | 1.26 |
| 399B-5 Novice Adapter (KWM-2) | 46.00 | 1.48 |
| **WATTMETERS** | | |
| 302C-3 Directional Wattmeter | 130.00 | 4.51 |
| **PHONE PATCH** | | |
| 189A-2 Phone Patch | 67.00 | 2.10 |
| **CABLES** | | |
| 440E-1 Cable (MP-1 to KWM-2) | 17.00 | .43 |
| **NOISE BLANKERS** | | |
| 136B-2 Noise Blanker (KWM-2) | 124.00 | 4.30 |
| **MECHANICAL FILTERS FOR 75A-4** | | |
| F455J-05 Mechanical Filter | 77.50 | 2.61 |
| F455J-15 Mechanical Filter | 58.00 | 1.91 |
| F455J-21 Mechanical Filter | 57.50 | 1.89 |
| F455J-31 Mechanical Filter | 57.50 | 1.89 |
| F455J-60 Mechanical Filter | 57.50 | 1.89 |

Terry W9DIA

**Get my fantastic trade-in offer on the 75S-3 Receiver today. You won't believe it!**



## Collins 75S-3 Receiver

Name your mode—CW, SSB or RTTY—the new Collins 75S-3 will give you the best in reception. The 75S-3 has Collins' famous frequency stability, plus: Q Multiplier, choice of variable or crystal BFO, 200 cycle crystal filter, 2. 1kc Mechanical Filter, and control of AVC. A new spinner knob provides ease of tuning, and AF-RF gain controls are conveniently located on concentric knobs.

**STAY ON THE AIR!**

Yes—Now not only will I give you a fantastic trade-in allowance for your old equipment on the new 75S-3, or any other Collins gear, but you can use it until you get my shipment. Then send me your trade-in.

### INFORMATION FOR ORDERING

Only $5.00 down is required for any New Collins Equipment. 10% is required for reconditioned equipment. Payments shown on new equipment are for 36 month Plan. A $60 order for either new or used equipment, may be financed up to one year, two years on a $120 order, or Three years on $180 order. If you do not already have one of our Credit Cards, to speed your order you should supply us with the credit information when you send in your down payment. See page 108 of this magazine. Persons purchasing on our time payment plan must be of 21 years of age and regularly employed. Service men with APO addresses with good credit ratings accepted.

### RECONDITIONED COLLINS GEAR

| | | | | | |
|---|---|---|---|---|---|
| KWM-1 Spkr. | $ 9.00 | 75A-1 Rec. | 219.00 | 75A-4 Spkr. | 19.00 |
| KWM-1 Console | 79.00 | 75A-2 Rec. | 279.00 | 75S-1 Rec. | 349.00 |
| KWS-1 Xmtr. | 895.00 | 75A-2 Spkr. | 14.00 | 312B-3 Spkr. | 19.00 |
| 30S-1 Linear | 895.00 | 75A-3 Rec. | 369.00 | 399C-1 PTO | 124.00 |
| 32V-1 Xmtr. | 159.00 | 75A-3 Spkr. | 14.00 | 516E-1 Sup. | 139.00 |
| 32V-2 Xmtr. | 209.00 | 75A-4 Rec. | 449.00 | 516F-1 Sup. | 74.00 |

**AMATEUR ELECTRONIC SUPPLY**

**THREE STORES TO SERVE YOU**

**Please send mail orders to Milwaukee Store**

**3832 West Lisbon Ave., Milwaukee 8, Wis. • PHONE WEST 3-3262**

**CHICAGO 31, ILL.**
6450 Milwaukee Ave.,
PHONE RO 3-1030

**ORLANDO, FLORIDA**
23 Azalea Park
Shopping Center

**Amateur Electronic Supply—Mail Order Dept. J-122**
**3832 W. Lisbon Ave., Milwaukee 8, Wisc.**

Ship me .....

I enclose .....: I will pay the balance in

☐ 1 year ☐ 2 years ☐ 3 years

**If new account—enclose credit information—see page 108 for details**

I want to buy..... and want to trade

..... What's your deal?

Name.....

Address.....

City..... State .....

Send reconditioned equipment bulletin

For further information, check number 39, on page 128

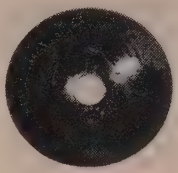
# FREE Catalog

OF THE WORLD'S FINEST ELECTRONIC GOV'T SURPLUS BARGAINS

## PARABOLIC ANTENNA

***ANTENNA REFLECTOR***

Four (4) Foot diameter Aluminum Parabolic Dishpan type with 21" antenna feed, approx. 7000 MC, and 3" round mounting for 1-5/16" x 5/8" wave guide. Four mounting brackets with hardware. Painted gray. Net Wt.: 55 lbs.



Price ..... $29.95

Price—with heater defrost attachment ..... $39.95

Same as above—Six (6) Foot Diameter ..... $49.95

(Not available with defrost attachment.)

**REFLECTOR**—Plane (flat) type configuration. Aluminum—8 ft. L x 6 ft. W. Mounted by framework of Reflector and "L" shaped bracket, with necessary hardware & guys. Approx. Net Wt.: 125 lbs. Shpg. Wt.: 375 lbs. Price ..... $75.00 (Photo sent on request.)

Address Dept. CQ • All Prices are F.O.B., Lima, Ohio
25% Deposit on C.O.D.'s • Send for FREE Catalog Today!

**FAIR RADIO SALES**
2133 ELIDA RD. • Box 1105 • LIMA, OHIO

For further information, check number 52, on page 128

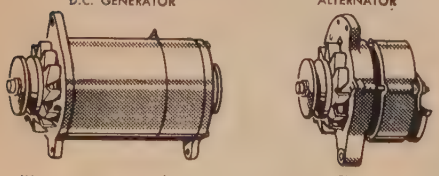
# SAY "GOOD-BYE" TO

Dead batteries—Regulator hash QRN —Generator whine—Noise filters— Burnt out generators.

# SAY "HELLO" TO

8 to 15 Amp charge *at idle*—Up to 55 Amps full output—Stronger signals —Higher efficiency—Longer battery life—Smaller size.

D.C. GENERATOR ALTERNATOR



It will pay you to change your present DC generator NOW for a new all-electronic silicon transistor controlled Alternator. Guaranteed up to 30,000 miles or 3 years. (Save generator, to turn in with car. Order new car less generator.)

Mention make, year and model of car, single or dual generator pulley, belt width. We'll send you everything you need, including truly universal mountings and detailed, simple "do-it-yourself" instructions, for ONLY **$74.95**

*Delivered Free in 50 U.S.A. if full remittance with order.*

**HARRISON**
"HAM HEADQUARTERS, USA"
227 Greenwich Street
New York 7, N. Y.

For further information, check number 53, on page 128




## Shadow Reception [*from page 53*]

polarized perpendicular to the long edge of the obstacle causing the shadow.

Perhaps it may be well to mention that if the plane wave is vertically polarized when it strikes the hill, the diffracted cylindrical wave in the shadow region will be polarized in the vertical *plane* (that is, in the plane of the page for fig. 1), but also perpendicular to a straight line from the receiving station to the hill top, so that the vertical polarization is not preserved. If the plane wave is horizontally polarized, the cylindrical wave will retain the horizontal polarization.

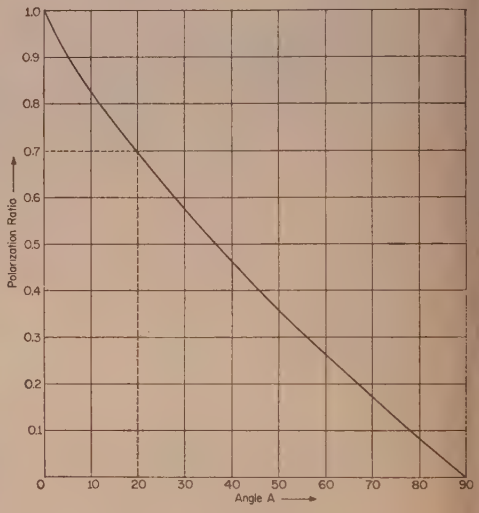



Fig. 3—The vertical axis is the ratio of the field strength in the shadow region for a horizontally polarized incident plane-wave to that of a vertically polarized wave.

### *Building Shadows*

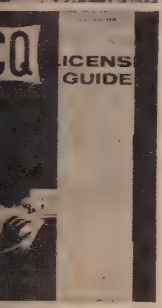
Consider briefly the problem of reception or transmission behind a tall, narrow building as a contrast to the long hill or dam. Here we may approximate the building with a tall, thin plate and consider that the signal in the shadow region is produced by two fictitious vertical antennas located along each of the two long edges. Here too, the longer the wavelength, the more diffraction, but the situation is somewhat complicated by interference between the two cylindrical waves. According to our general rule for polarization, we would now expect horizontal polarization to give the larger signal.

It might be well to mention that we have simplified the problems considered in the article in order to point out the main features of diffraction. Thus ground reflections have been ignored, and we did not distinguish between a ground and sky wave. While these effects would alter the numerical values stated in the examples, the overall results remain unchanged. Inclusion of these effects would only obscure the fundamental principles and defeat our original purpose. ■

# THE CQ HAM MART

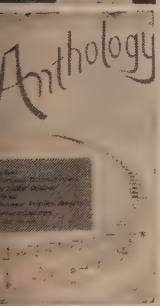
## MOBILE HANDBOOK

Anyone who tries to go mobile without getting this book, should think twice before going ahead. *Bill Orr, W6ASI* has put everything you need to know in this book, Build-its by the dozen . . . solutions to ignition problems, keeping the battery charged, noise . . . only *$2.95* postpaid.




## CQ LICENSE GUIDE

212 pages of everything the Amateur must have to get his license and progress toward the general class ticket. Plus many additional pages of vital information for the ham operator. All this for only *$2.50*.




## CQ ANTHOLOGY

Most amateurs do not have a good file of back issues of *CQ*. So we've looked back through the years *1945-52* and assembled all in one place the articles that have made a lasting stir. The issues containing most of these articles have long ago been sold out. The price is a mere *$2.00*.

## THE NEW RTTY HANDBOOK

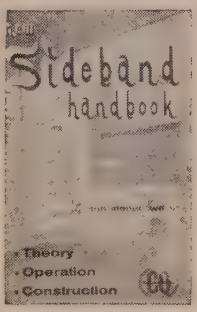
A treasury of vital and "hard to get" information. Loaded with equipment schematics, adjustment procedures, operating procedures, etc. A valuable asset to both the beginning and the experienced RTTY'er. Special section on getting started, all written by *Byron Kretzman, W2JTP*, a well known authority in the field. This book is a must for your library! Only *$3.95*.

## VHF FOR THE RADIO AMATEUR

You can't afford to be without this dynamic new handbook designed with the VHF amateur in mind. Filled from cover to cover with all new and original construction material presented so that you can understand it. Written by *Frank C. Jones W6APF*, nationally acclaimed for his VHF pioneering. Available now for only *$3.50*.

## COMMAND SETS

This is a collection of reprints, containing all of the available information on the conversion of the popular "Command" transmitters and receivers into good ham transmitters and receivers. Invaluable for Novice, Technician, General, Advanced and Extra class operators. 136 fabulous pages, only *$1.50* postpaid.




## SIDEBAND HANDBOOK

Written by *Don Stoner, W6TNS*, was almost one full year in the preparation of this terrific volume. This is not a technical book. It explains sideband showing you how to get along with it . . . how to keep your rig working right . . . how to know when it isn't . . . and lots of how to build-it stuff, gadgets, receiving adaptors, exciters, amplifiers. Price, only *$3.00*.

**COWAN PUBLISHING CORP.** CQ-M
**Book Division**
**300 West 43rd Street**
**New York 36, N. Y.**

| | | |
|---|---|---|
| LIGHTED GLOBE | $24.95 | ☐ |
| UNLIGHTED GLOBE | 19.95 | ☐ |
| ATLAS | 15.00 | ☐ |
| COMMAND SETS | 1.50 | ☐ |
| CODE RECORD | 3.50 | ☐ |
| REGULAR LOG SHEETS (100) | 1.00 | ☐ |
| SSB LOG SHEETS (100) | 1.00 | ☐ |
| HAM'S INTERPRETER | 1.50 | ☐ |
| TVI HANDBOOK | 1.75 | ☐ |
| BINDER—YEAR WANTED | 4.00 | ☐ |
| VHF FOR THE RADIO AMATEUR | 3.50 | ☐ |
| CQ ANTHOLOGY I | 2.00 | ☐ |
| CQ ANTHOLOGY II | 3.00 | ☐ |
| HI-FI BOOK | 2.50 | ☐ |
| SIDEBAND HANDBOOK | 3.00 | ☐ |
| CQ LICENSE GUIDE | 2.50 | ☐ |
| SURPLUS SCHEMATICS HANDBOOK | 2.50 | ☐ |
| DX ZONE MAP | 3.00 | ☐ |
| NEW RTTY HANDBOOK | 3.95 | ☐ |
| DIODE SOURCE BOOK | 2.50 | ☐ |
| USA-CA RECORD BOOK | 1.25 | ☐ |
| "NEW" MOBILE HANDBOOK | 2.95 | ☐ |

SIRS: My check (money order) for $_____ is enclosed. Please send the following items to:

Name_____

Address_____

City_____ Zone____ State_____

New York City Residents Add 3% Sales Tax

B&W

MODEL 850A
$35.00

PI NETWORK COILS

MODEL 851
$16.50

MODEL 852
$39.50

Now—Pi-Network inductors specially tailored for your needs. Here are highly-efficient, super compact tank coils incorporating the unique feature of integral band switching.

Model 850A and Model 852, now complement the famous B&W Model 851. All are designed for single or parallel tube operation on 80, 40, 20, 15, 11 or 10 meters, with top efficiency in Class "C" or linear operation. Windings give ample current carrying capacity with optimum "Q" over the entire operating range.

See these superior B&W inductors at your dealers *now*, or write B&W direct for detailed information.

**BARKER & WILLIAMSON, Inc.**
Radio Communication Equipment Since 1932
BRISTOL, PENNSYLVANIA • STillwell 8-5581

For further information, check number 43, on page 128

CALL LETTER SIGNS

Order your call in neat 2-inch die cut letters with finished base. Just right for the shack. You assemble. Letters: 3/32" silver showcard stock. Base: Stained select quality wood.

*Price $1.00 Postpaid*

NEW PRODUCTS Dept. B
Box 481 Grand Haven, Mich.

SINGLE POLE, SIX-THROW
COAXIAL RELAY
FOR MOUNTING ON MAST AND REMOTE SWITCHING UP TO 6 ANTENNAS

DOW DKC 71

Weatherproof, electro-magnetic, less than 1.1:1 VSWR at 100 mc, 1 kw power rating, available in UHF, N, BCN, TNC, C connectors. Continuous duty, over 1,000,000 operations. 5¾" x 2¾", silver plated connectors.

DKC-71 with UHF Connector
$49.50

Manufactured and Guaranteed by ....
DOW-KEY COMPANY
THIEF RIVER FALLS, MINNESOTA

HAVE YOU SEEN PAGE 6

## Novice [*from page 108*]

keep in mind that I am west of the International Date Line and that Saturday night here is Friday morning Stateside.

"For many years I have wanted to become a ham but it somehow never happened. It took a few evenings of sitting around in the shack with Mac, KG6-AJB to get the hook all the way in and set. Mac showed me the ropes and then kindly administered the Novice exam. I ran into snags building my transmitter so along came Ron, W6CBE/KG6 and Bob, KG6ALD to offer advice and assistance. It never ceases to amaze me the way a ham is always just a phone call away to help any way he can. I sometimes think they sit by the phone just waiting for someone to call for help, so it seems anyway. I owe Mac, Bob and Ron a lot for the help they have given me and feel the only way I can repay them is to be a good operator so that they won't feel that their time was wasted. I hope other novices that have received help feel as strongly about this as I do. You and some of the *CQ* staff should be included in this Walt as your articles and tips help a lot more than you sometimes realize.

"I hope to meet you on the air sometimes, Walt, along with other hams working the Novice bands. I also hope to go s.s.b. after the first of the year with you and have a good ragchew as my stateside QTH is also in Ohio. 73 to you and the *CQ* staff and thanks again for the fine column. Mel, WG6ALS." Mel can be addressed as S/Sgt. Mel Fenrich, USAF, 1956-B Kwajalein Lane, APO 334, San Francisco, California.

"Dear Walt: have been wanting to write to you since you started the NOVICE column, but never took time as I imagine there are a lot of people like ourselves. We never miss reading your very helpful advice and the way you break down things and explain power supplies, modulation, power transformers and the other sections of transmitters.

"We are three Novices here, myself, WN9AKP, the 14 year son WN9AKQ, and the chief c.w. operator, the XYL, WN9AKR. She has just received her WAS in less than 10 months. She also has a QSL from the Virgin Islands and one from K3LX who is on almost every day on 21 mc. He says he QSLs 100% and asked that the word be passed on to all Novices and he has a special QSL for XYLs. WN9AKR was his first XYL QSO.

"We are now working hard to get our Generals. We have a Bud code oscillator and practice c.w. by passing questions and answers on it. Thus we learn both code and theory at the same time.

"So Walt, we will say 73 for now and we will be looking for more helpful articles in your column. Best of luck from Edward Richard, WN9AKP, Edward Richard, Jr., WN9AKQ and Marcelle Richard, WN9AKR.

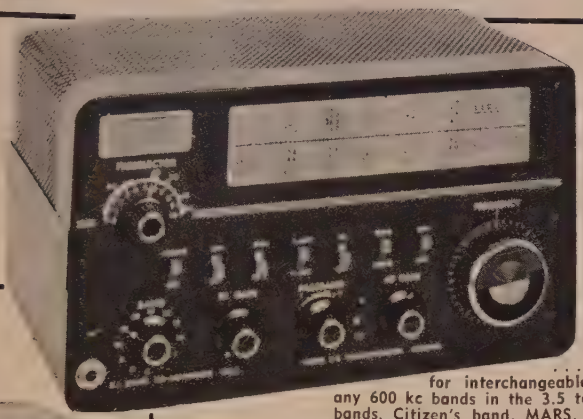
"P.S. QTR on HK3LX was 1630 G.M.T., E.R.

Help Wanted department this month is negative. I guess everyone is busy or just needs no help. If you find that you are in need of help, however, let me know and I'll see what I can do about it. I hope to get caught up on the letters that I must answer this month and then I can begin getting that new transmitter and receiver started for you along with the new converters for 2, 6, 15 and 20 meters. I have some dope on repair of receivers that will be available for the column as soon as I can simplify it for your consumption and make it simple enough for the beginner to use; there is already plenty of dope for you old timers and experts.

I just happen to look down at the bottom of this column and note that it says "December." Isn't that the month that the jolly old timer in the red suit and whiskers does most of his operation? I hope ole SAØNTA contacts and QSLs each of my readers and leaves you the one thing that you need most. I also hope he can bring you time enough to do the things you desire, and bring peace and happiness for all on this earth. I only wish he could make us have this spirit throughout the year and not just for a few weeks every year. Merry Christmas and a Happy New Year! 73, Walt, W8ZCV

Terry Sterman
W9DIA

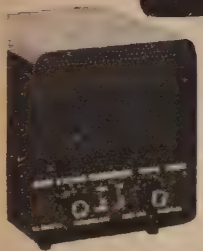
# I Will Ship a New Factory Sealed DRAKE 2B RECEIVER for just $5.00 DOWN-$9.95 per month



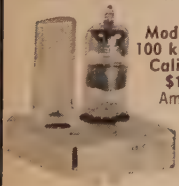
## Fantastic Trade-In Deals —

### Tell us what you have

All the advantages of a "HAM BAND ONLY" receiver. Superior SSB, AM, and CW in seven band switch positions . . . PLUS five extra positions on the band switch for interchangeable plug-in crystals to permit reception of any 600 kc bands in the 3.5 to 30 mc range, such as shortwave broadcast bands. Citizen's band, MARS, WWV, Commercial frequencies, and others.
**Ham Net $279.95 — Low as $9.92 per month**



Model 2BQ Combination Q-Multiplier and Deluxe Speaker for notching heterodynes or single signal CW.
$39.95 AMATEUR NET



Model 2-AC 100 kc Crystal Calibrator $16.95 Am. Net

### LOOK HOW EASY TERRY MAKES IT TO OPERATE DRAKE GEAR!

| | Amater Net Price | Monthly Payments 1 Year | 2 Years | 3 Years |
|---|---|---|---|---|
| 1) Model 2-B Communication Receiver SSB, AM, and CW | $279.95 | $25.20 | $13.74 | $9.92 |
| 2) Model 2-AC Calibrator | 16.95 | 1.62 | .81 | .54 |
| 3) Model 2-BS Speaker | 16.95 | 1.62 | .81 | .54 |
| 4) Model 2-BQ Q-multiplier Speaker combo | 39.95 | 3.53 | 1.76 | 1.26 |

**— AND ALL YOU PAY DOWN IS JUST $5.00 ! ! !**

Terms above apply to three year contract. Minimum order financed for 1 year, $60; 2 years, $120; 3 years, $180. Persons signing time pay contracts must be 21 or over and employed.

### USED DRAKE EQUIPMENT

| | |
|---|---|
| 1-A Receiver | $169.00 |
| 2-A Receiver | 199.00 |
| 2-B Receiver | 219.00 |

10% DOWN—Up to 3 Years to pay (two years on 1-A receiver)

**STAY ON THE AIR**

Terry's exclusive plan. Keep your trade-in equipment until your equipment arrives!

## AMATEUR ELECTRONIC SUPPLY

**THREE STORES TO SERVE YOU**

**Please send mail orders to Milwaukee Store**
3832 West Lisbon Ave., Milwaukee 8, Wis. • PHONE WEST 3-3262

**CHICAGO 31, ILL.**
6450 Milwaukee Ave.,
PHONE RO 3-1030

**ORLANDO, FLORIDA**
23 Azalea Park
Shopping Center

Amateur Electronic Supply—Mail Order Dept. M-122
3832 W. Lisbon Ave., Milwaukee 8, Wisc.

Ship me .....
I enclose .....; I will pay the balance in
☐ 1 year ☐ 2 years ☐ 3 years ☐ C.O.D.
I want to buy ..... and want to trade
..... What's your deal?
If new account—enclose credit information—see page 108

Name .....
Address .....
City ..... State .....
☐ Send reconditioned equipment and sale bulletin.

For further information, check number 41, on page 128

HAMMARLUND
New York Headquarters

HQ-180C RECEIVER

Combines fine s.s.b. reception with general coverage. Covers 540 kc to 30 mc in 6 ranges with bandspread dial calibrated for the 80-10 meter Ham band. Triple conversion from 7.85 to 30 mc. Sensitivity 1½ uv. on a.m. and ½ uv. on c.w. for 10 db s/n ratio.

In midtown—be sure to see ERNIE W2QJP for immediate service. $439.00

EVERYONE eventually goes to

1 Door East of Lexington Ave.

124 East 44th Street, N.Y.C. • MU 2-3869

For further information, check number 44, on page 128

HAVE YOU SEEN PAGE 6

EASY TO LEARN CODE

It is easy and pleasant to learn or increase speed the modern way—with an Instructograph Code Teacher. Excellent for the beginner or advanced student. A quick, practical and dependable method. Available tapes from beginner's alphabet to typical messages on all subjects. Speed range 5 to 40 WPM. Always ready, no QRM, beats having someone send to you.

ENDORSED BY THOUSANDS!

The Instructograph Code Teacher literally takes the place of an operator-instructor and enables anyone to learn and master code without further assistance. Thousands of successful operators have "acquired the code" with the Instructograph System. Write today for full particulars and convenient rental plans.

INSTRUCTOGRAPH COMPANY

4711 SHERIDAN RD., CHICAGO 40, ILL.
4700 Crenshaw Blvd., Los Angeles 43, Calif.

**YL** *[from page 81]*

*YL Harmonics* effective with the Jan.-Feb. issue. Edie and her OM, K1GUU, got their licenses in Jan. '58, after taking evening classes at M.I.T. The year before when Edie was recovering from spinal surgery and unable to move around her OM placed a tape recorder with c.w. tapes just out of her reach but well within her hearing and suggested she memorize the code! Edie adds she has never regretted this gentle push into ham radio. Edie operates 80 through 10, favoring 75 phone and 15 and 20 ssb; 6 and 2 for contests. She enjoys YL contests, overseas phone patching, and holds 24 certificates, among them YLCC and DX-YL. Edie and Bill have one jr. op, nearly 3. Only other Ham in the family is Edie's brother Ted, K1RZQ.

K5MJW, Betty, will be continuing her work as YLRL's DX chairman. K6OQD asks that any YL who is sponsoring a foreign YL send in the dues for such adoptee in November or December so Betty will be able to determine which YLs will be available for adoption, and so there will be no interruption in mailing *Harmonics*.

### Club News

The POOS (Petticoat Operators Of Six) elected these officers: Pres., K3DIG, Alice; secy, K3KYI, Ginny; treas., K3BAK, Lorraine; NCS, K3COP, Betty. The POOS meet Thursdays at 2100 on 50.5 Mc.

### Congratulations . . .

To K8ONV, Mary Ryden (see photo/write-up November *CQ*) on achieving WPX. She received award No. 106 for SSB WPX and 346 for CW WPX . . . To KP4CL, Alicia Rodriguez, for being the first recipient of the DX-100-YL award (sponsored by The *Monitor;* custodian W5JCY).

W4SGD, Katherine, custodian of the YLCC award, reports the following Hams hold YLCC/500 or more for confirmed contacts with the number of YLs as indicated: W2QHH, 1200; W4SGD, 1000; W8HWX, 650; K5BNQ, 650; W9CMC, 600; K6EXQ, 550; K4RNS, 550; W4HLF, 500, W4VCB/3, 500; W5JCY, 500; K5OPT, 500.

### Continental QSL Club

Something new in service—the Continental QSL Club. Dues are $3 per year and cover unlimited use of free automated mailing service. One writes the call of the station being QSL'ed in the corner in the place for the stamp. Cards are then sent in bulk (mailing labels furnished free) to the QSL Club where they are processed and remailed. OTH's are current with weekly lists from FCC. By keeping an s.a.s.e. on hand at the Club incoming cards are mailed to members weekly. Address the club at P.O. Box 92, Dabel Station, Dayton 20, Ohio.

### W7GGV says . . .

"Thanks to *CQ YL* I did some research on the

*[Continued on page 120]*

LRL-70 ANTENNA 70' LONG, 80 & 40 M • Power rating 2 Kw. P.E.P. or over

PRICE $30.00 in Cont. USA, ppd.

OPERATES ON 2 BANDS AUTOMATICALLY
1. Loading coils for 80 & 40M doublet operation
2. Adjustable ends to set 80 meter resonance SWR 1.5:1 or less at resonant frequencies
3. Center insulator with female coax connector to take PL-259 plug
4. Fittings on insulators to tie on rope Use RG-8/U feeder

Lattin Radio Laboratories Box 44 Owensboro, Kentucky

"— with a MATERIAL DIFFERENCE!"

## "BEAMED-POWER" ANTENNAS and ANTENNA SYSTEMS

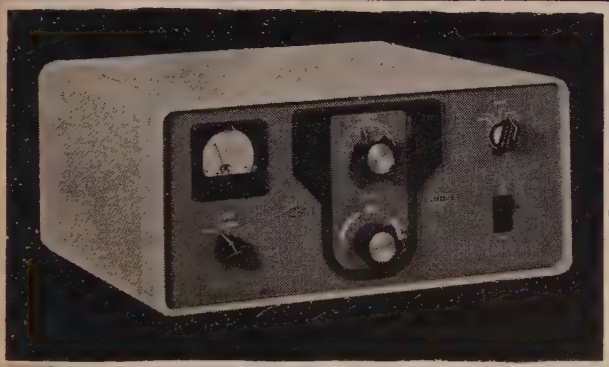
The Choice of the Discriminating Communication Engineer . . . the Man who Never Settles for Anything Less than THE-VERY-BEST!

You too — can enjoy World renowned Telrex performance and value!
Send for PL77 condensed data and pricing catalog, describes 107 popular amateur antennas from $6.95 to $999.00. Expanded data sheets — Your favorite band, also available.

ANTENNAS SINCE 1921 — Telrex LABORATORIES — Communication and TV Antennas

ASBURY PARK 25, NEW JERSEY, U.S.A.

For further information, check number 46, on page 128



## HOW COMPACT CAN YOU GET?

**(as compact as Collins has made the 30L-1).** This tightly engineered, new 1000-watt linear amplifier is the same size as the famous Collins KWM-2. It has a self-contained power supply, too. Its price: $520. Its appearance: "solid quality". Order the Collins 30L-1 now, for early delivery.

C & G ELECTRONICS
Northwestern headquarters for Collins
2502 Jefferson Avenue, Tacoma 2, Wash.
2221 3rd Avenue, Seattle 1, Wash.

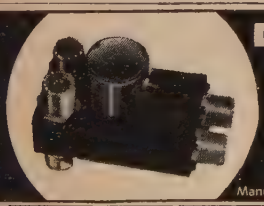
For further information, check number 45, on page 128

## LOOKING FOR A TOWER?

Write today for the all-new TRISTAO catalog. A completely new concept in tower design for all amateur applications. TRISTAO—an old name in tower design with a new style and a brand new line.

**TRISTAO Towers, Inc.**
242 South J St., Dept. CQ12, Tulare, California

HAVE YOU SEEN PAGE 6



## DOW-KEY'S DK2-60 DPDT r.f. SWITCH

DK2-60 with UHF Connectors, each $19

For Switching 2 Coaxial Lines Simultaneously!

Freq. 0 to 500 mc; Power Rating to 1 kw; VSWR, less than 1.15 to 1 from 0 to 500mc; Standard coil voltage.....and other r.f. Connectors available.

Manufactured and Guaranteed by DOW-KEY CO., Thief River Falls, Minn.

## LRL-66 ANTENNA

66' LONG, 80 THRU 10M

Power rating 2 Kw. P.E.P. or over on 80, 40, 15 On 20 and 10 1 Kw. P.E.P. Transmitter Input

PRICE $30.00 in Cont. USA, ppd.

OPERATES ON 5 BANDS AUTOMATICALLY
1. Loading coils for 80 & 40M doublet operation
2. Adjustable ends to set 80 meter resonance
3, 4. Decoupling stubs for 20 & 10 meters
5. Center insulator with female coax connector to take PL-259 plug
6. Fittings on insulators to tie on rope

Lattin Radio Laboratories — Box 44 — Owensboro, Kentucky

# TV INTERFERENCE?

A B&W low pass filter will end interference with your neighbors TV reception. B&W Model 424 is a three-section low pass filter which installs in the antenna coaxial line. Reduces all frequencies within the TV band by 60 db (*a reduction of 1-million times*).

The B&W Model 424 offers negligible filtering to frequencies below 30mc. Made for installation in 52 and 72 ohm coax lines. Ideal for any transmitter (*up to 100 watts*) operating between 1.5 and 30 mc.

*At your dealers for only* **$8.65**

B&W

**BARKER & WILLIAMSON, Inc.**
BRISTOL, PENNSYLVANIA

For further information, check number 47, on page 128

HAVE YOU SEEN PAGE 6

**FOR CHRISTMAS & EVERY DAY ELECTRONIC THINGS ARE BEST**

Send For RADIO SHACK's 1963 Electronics Catalog

**FREE** For you and two friends.

Today, electronic equipment is the most exciting thing you can own or give—hi fi, radios, tape recorders, tapes, records, tubes, test equipment and thousands of others. For the finest, at lowest prices, send for Radio Shack's wonderful new 284 page catalog for yourself and 2 friends. Satisfaction Guaranteed.

RADIO SHACK CORP. Boston 17, Mass.

**MAIL COUPON TODAY**

Without obligation send me your NEW catalog: FREE & POSTPAID

Your Name_____

Address_____ 62M21

City_____ Zone____ State_____

**Fill in names of two interested friends.**

Name of a friend_____

Address_____ 62M21A

City_____ Zone____ State_____

Name of a friend_____

Address_____ 62M21B

City_____ Zone____ State_____


## YL [*from page 118*]

gals who were to read letters at the National Conv. YLRL Forum and found we had three ex-presidents on the forum: W7HHH, W7NJS and K4LMB (ex-W7FWB). From the pictures I was able to recognize a number of the gals. *CQ YL* helped me a lot!" FB, Helen.

Now you gals and guys may not be running a forum, or even attending a convention, but you'll *still* find *CQ YL* interesting and useful in your QSOs and contacts. The one and only book about the YLs, it contains 18 chapters, over 500 photographs, references to hundreds more YLs. Order from W5RZJ (QTH at head of column), $3, postpaid.

Happy Holidays and all the best for '63!

33, W5RZJ

## Packaged Power on 6 [*from page 33*]

STEP 4—Set $S_2$ to read 6146 grid current, and adjust $L_3$ and $L_4$ for maximum. The final reading should be somewhere between 4.0 and 6.0 ma. *Caution must be exercised here.* If 6146 grid current is significantly lower than this, you may be tuned to the wrong response somewhere along the line. If so, go through the entire $L_1$-$L_4$ sequence again (with $S_2$ in the 6146 grid position) until a reasonable reading is obtained. As a final precaution, check the interstage frequencies with a wavemeter or all-band receiver. Oscillator output should be in the 25 mc region and doubler output in the 50 mc band.

STEP 5—If any coil approaches or just reaches resonance with its slug completely retracted, remove one turn at a time until it tunes cleanly through the desired peak. If a slug turns all the way in without hitting a distinct peak, a turn or two must be added. Don't jump at conclusions, however! Go through the entire $L_1$-$L_4$ sequence first, and be certain that all are tuned to the proper frequencies before performing surgery. It is extremely doubtful that any changes will be necessary.

STEP 6—Set $S_2$ to read 6146 plate current, and resonate $C_6$. With $S_3$ in the TUNE position, the dip will be barely discernible.

STEP 7—Return $S_2$ to the 6146 grid position, and readjust $L_1$-$L_4$ for maximum reading. At this point forget about $L_1$ and $L_2$.

STEP 8—Set the transmitter frequency to about 50.30 mc, leave $S_2$ in the 6146 grid position, and tune $L_3$ for maximum reading. Move to about 50.80 mc, and tune $L_4$ for maximum. Repeat the adjustments until no further change occurs.

STEP 9—Check 6146 grid current as the transmitter is moved across the 50.0-51.0 mc segment. It should remain reasonably constant, dropping off slightly at the ends of the range (it will probably fall off most at the high end). In making this check, try not to be fooled by crystals which are less active than others or by major changes in v.f.o. output. Unusual

*(Continued on page 127)*

# $5.00 DOWN ...UP TO 3 YEARS TO PAY

# DELIVERS ANY NEW GONSET EQUIPMENT

## NEW GONSET EQUIPMENT

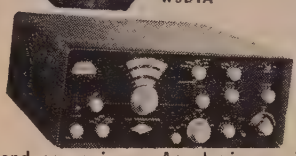
| | Amateur Net Price | Monthly Payments |
|---|---|---|
| **COMMUNICATOR SERIES** | | |
| GC-105—2 meter "Gooney Bird" | $272.95 | $ 9.67 |
| 3341—2 meter Comm. IV | 409.95 | 14.62 |
| 3342—6 meter Comm. IV | 409.95 | 14.62 |
| 3351—220 Mcs. Comm. IV | 409.95 | 14.62 |
| 3357—VFO 2, 6 meter & 220 MCS | 89.95 | 3.06 |
| 3363—Canvas Carrying Bag | 12.95 | .42 |
| 3409—Civil Defense Kit | 34.95 | 1.08 |
| **FIXED STATION COMMUNICATORS** | | |
| 3221—G-50 6 meter Comm. | 367.30 | 13.08 |
| **SINGLE SIDE BAND EQUIPMENT** | | |
| GSB-201—Linear Amplifier | 419.95 | 14.98 |
| **AM TRANSCEIVERS** | | |
| G-76—Transceiver | 451.32 | 16.11 |
| 3349—AC P/S For G-76 | 157.51 | 5.50 |
| 3350—DC P/S For G-76 | 157.51 | 5.50 |
| 3269A—Cry. calib. for G-76 | 16.95 | .54 |
| **ACCESSORIES** | | |
| 3365—Mug. Brackets | 4.26 | .15 |
| 3250—Microphone | 9.95 | .35 |
| GPP-1—Phone Patch | 49.95 | 1.62 |
| **MOBILE CONVERTERS** | | |
| 3261—Super 12 Conv. | 89.95 | 3.06 |
| 3163—Police Marine Conv. | 39.95 | 1.26 |
| 3247—30-40 Mcs. Conv. | 94.25 | 3.22 |
| 3251—40-50 Mcs. Conv. | 94.25 | 3.22 |
| **ALL BAND RECEIVERS** | | |
| GR-211 | 76.98 | 2.59 |
| GR-212 | 112.86 | 3.89 |
| **GROUND TO AIR PRODUCTS—AM** | | |
| 3139GA—118 to 138 Mcs. Comm. | 489.95 | 17.40 |
| GA-150—118 to 138 Mcs. 1 ch. | 335.00 | 11.91 |
| 3156B—108 to 135 Mcs. Receiver | 119.95 | 4.15 |

PRICES EFFECTIVE JUNE 1, 1962

## RECONDITIONED GEAR

| | | | |
|---|---|---|---|
| 3009 Conv. | $ 34.00 | Super 6 Conv. | 24.00 |
| G-43 Rcvr. | 69.00 | Super 12 (12V B+) | 39.00 |
| G-63 Rcvr. | 149.00 | 6M Conv. (H.V.) | 24.00 |
| 6M Conv. (12V. B+) | 34.00 | FM (88-108MC) | 29.00 |
| G-66 Rcvr. | 89.00 | Tri-Band Conv. | 19.00 |
| G-66B Rcvr. | 109.00 | Gonset Monitone | 14.00 |
| G-76 Tsvr. | 299.00 | Comm. I Tsvr. 2M | 119.00 |
| G-76 AC Supply | 99.00 | Comm. II 2M Tsvr. | 144.00 |
| G-76 DC PWR Sup. | 79.00 | Comm. III 2M Tsvr. | 179.00 |
| G-77A Xmtr. | 139.00 | Comm. III 6M Tsvr. | 149.00 |
| GSB-100 SSB Xmtr. | 274.00 | Comm. IV 220MC | 249.00 |
| GSB-101 Linear | 199.00 | Comm. IV 2M Tsvr. | 249.00 |
| GC-105 2M Tsvr. | 199.00 | Comm. IV 6M Tsvr. | 269.00 |
| GSB-201 Linear | 299.00 | Thin Pak PWR Sup. | 19.00 |
| GR-211 Rcvr. | 49.00 | Marine Mob. Conv. | 19.00 |
| Commander Xmtr. | 49.00 | 10 Meter Conv. | 9.00 |

Terry Sterman W9DIA



**More Gonset G-76's are sold at our stores than any other transceiver. Get yours for just $5 down and $16.11 per month.**

G-76 has every feature to make your mobile operation more enjoyable! First, excellent communication on any of 6 amateur bands—80, 40, 20, 15, 10 and 6 meters. Secondly, exceptional operating flexibility and convenience. Any tuning or indication element that requires an occasional quick glance while driving is fully visible. Receiver tuning dial . . . meter for output or "S" readings . . . transmitter VFO. And **every** control, including transmitter VFO and Band-switch, is conveniently at driver's fingertips because this fine-looking designer-styled package is just slightly over a foot wide, less than six inches high! Transistorized DC supply is separate, mounts in any small convenient space. You can take it out of your car, use it—with matching AC power supply and speaker assembly—for excellent 6-band fixed station operation.

**AMATEUR NET $451.32 — $5 DOWN**

### STAY ON THE AIR PLAN

Yes, now you can enjoy your new Gonset G-76 or any other new Gonset equipment without going off the air because you have shipped a trade-in, in. Keep your trade-in, if you have one, until you receive our shipment and you have the new equipment operating properly.

### INFORMATION ON FINANCING

Only $5 down is required for any New Gonset Equipment. 10% is required for reconditioned equipment. Payments shown on new equipment are for a 36 month plan. A $60 order for either new or used equipment, may be financed up to one year, two years on a $120 order, or three years on $180 order. If you do not already have one of our Credit Cards, to speed your order you should supply us with the credit information when you send in your down payment. See page 108 of this magazine. Persons purchasing on our time payment plan must be of 21 years of age and regularly employed. Service men with APO addresses with good credit ratings accepted.

## AMATEUR ELECTRONIC SUPPLY

**THREE STORES TO SERVE YOU**

**Please send mail orders to Milwaukee Store**
**3832 West Lisbon Ave., Milwaukee 8, Wis. • PHONE WEST 3-3262**

**CHICAGO 31, ILL.**
6450 Milwaukee Ave.,
PHONE RO 3-1030

**ORLANDO, FLORIDA**
23 Azalea Park
Shopping Center

**Amateur Electronic Supply—*Mail Order Dept.***
**3832 W. Lisbon Ave., Milwaukee 8, Wisconsin**

Ship me .....

I enclose .....: I will pay the balance in

☐ 1 year ☐ 2 years ☐ 3 years

If your credit has not been approved see page 108 for credit information required.

I want to buy ..... and want to trade

..... What's your deal?

Name .....

Address .....

City ..... State.....

☐ Send reconditioned equipment bulletin.

For further information, check number 42, on page 128

# GUARANTEED CRYSTALS!

ALL MARINE FREQ.-FT-243, DC-34 Holders. Tol. .005% $2.50
POLICE, C.A.P., CD, MARS. Tol. .01%..... $2.00
CITIZENS BAND—11 METERS—.005% Tol.
26.965 to 27.225 MC, 3rd Over. Herm. Seal or FT-243 $2.95
13.4825 to 13.6125 MC, 2nd Harm.Herm. Seal or FT-243 $2.95
6741.25 to 6806.25 Kc, 4th Harm. FT-243 only..... $2.50

**SPECIAL! STOCK CRYSTALS**

FT-243 Holders 5700 KC to 8700 KC in steps of 25 KC's

**$1.19 ea.**

**SEND FOR FREE CATALOG**

DC-34 Holders 1690 KC to 4400 KC steps of 10 KC ea $1.19

**NOVICE BAND FT-243 Fund. 1.49 ea.**

80 Meter 3701-3748—Steps of 1 KC. FT-243
40 Meter 7150-7198—Steps of 1 KC. FT-243
Dbl. to 40 Meter 3576-3599. Steps of 1 KC. FT-243
15 Meter 5276-5312—7034-7083 Steps of 1 KC. FT-243

FT-243—2 Meters (Steps of 1 KC) ..... $1.49
FT-243—6 Meters (Steps of 1 KC) ..... $1.49
FT-243—From 3000-4000 ..... $1.49
FT-243—From 1005-2999 (Steps of 5 KC) ..... $2.50
FT-241 SSB Low Freq. Xtals 370 to 540 KC (Steps of 1.852 and 1.388) ..... $ .69
FT-241 SSB Matched Pairs ..... $2.39

Include 5c per crystal for postage (U. S. Only) Calif. add 4% Tax. No C.O.D.'s. Prices subject to change. Ind. 2nd choice; substitution may be necessary. MIN. ORDER $2.50

"The House of Crystals"

**U. S. CRYSTALS, Inc.**

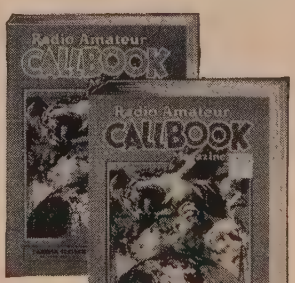
1342 S. La Brea Ave. Los Angeles 19, Calif.

For further information, check number 48, on page 128



THREE IMPORTANT REASONS WHY YOU NEED THE

**NEW 1962 WINTER CALLBOOK**




- If your present CALLBOOK is only a year old, over 20% of the listings have been changed or added!

Foreign Listings (All outside U.S.) $3.00

U.S. Listings (All K and W calls) $5.00

- *Over 13,000 new amateurs added since the Summer, 1962 issue—another major license increase!*
- Completely revised essential data—latest international prefixes, Q signals, postal info., airline distances, time chart, etc.

Now on sale at your amateur equipment dealer; if not conveniently located you may order by mail (please add 25¢ for mailing) from:

**RADIO AMATEUR CALLBOOK, INC.**
Dept. C, 4844 Fullerton Ave., Chicago 39, Ill.

P.S. Write for illustrated brochure on exclusive WORLD ATLAS . . . DX GUIDE . . . SPECIAL FULL COLOR MAPS.


# Ham Shop

Rates for the HAM SHOP are 5¢ per word for advertising which, in our opinion is obviously of a non-commercial nature. A charge of 25¢ per word is made to all commercial advertisers or business organizations.

Your copy should be preferably typewritten, double spaced on one side of the page only.

We do not bill for advertising in the HAM SHOP. Full remittance *must* accompany all orders.

Closing date is the 15th of the 2nd month preceding date of publication.

We reserve the right to reject advertising which we feel is not of an amateur radio nature.

Because the advertisers and equipment contained in the HAM SHOP have not been investigated, the publishers of *CQ* cannot vouch for the merchandise listed therein.

TUBES WANTED. All types. Highest prices paid. Writ Lou-tronics, Inc., 131 Lawrence Street, Brooklyn 1, N. Stamp for ham tube list.

SURPLUS "GREAT BUYS" ARR-27 Receiver 70 lbs. ea 432 modification $27.50, two—$50. APIX-2, 56 lbs. $17.5 two—$30. Dynamotor PE94, 45 lbs. $1.50. Gyro APA 16 lbs. $3.95 Experimenters Special. All Items New. L 10¢. Fertik's Ninth Tioga, Phila. 40, Pa.

WANTED: Teletype printers, perforators, reperforato transmitter-distributors test equipment: Model #14, # #19, #26, #28, etc. All types Collins receivers, 51J, R-3 R-390, 75A, etc. Cash or trade for NEW amateur equipme Tom, W1AFN, Alltronics-Howard Co., Box 19, Boston Mass. (RIchmond 2-0048).

BARGAINS! Used equipment sold! Traded! Wanted! other Hams in "Equipment Exchange Bulletin". Sam copy free! Write: Brand, Sycamore, Ill.

COLLINS OWNERS WORK AM: Wired Kit $5.00. stant Switching! Install five minutes! Kit Kraft, Harlan, K

TOROIDS: 88mhy with mounting hardware. Uncased; li new. Information sheet included. $1 ea, 5/$4.00 postpa KCM, Box 88, Milwaukee 13, Wis.

WANTED: Commercial or Surplus Airborne, Groun Transmitters, Receivers, Testsets, 618S, 18S, 17L, 51 ARN14, GRC, PRC, BC, ARC, BENDIX, COLLIN others . . . RITCO BOX 156, Annandale, Va.

ELECTRONIC TIE CLIP—Lucite imbedded 3/9 meg 1/ watt resistor mounted on high quality clip. Very sma appearance. Ideal gift. Send $2.00 to RK Specialties P. Box 1682, OrlovistaBranch, Orlando, Florida. Money Ba Guarantee.

ATTENTION MOBILEERS! Heavy duty Leece-Neville volt 100 amp system $50; 12 volt amp system $50; 12 vo 60 amp system $60; 12 100 amp system $100; Built silicon rectifier alternators 12 volt 60 amps $100; 12 vo 100 amps $125. Guaranteed no ex-police car units. Herbe A. Zimmerman, Jr., K2PAT, 1907 Coney Island Avenu Brooklyn 30, N.Y., Tel: DEwey 6-7388.

ONE THIN DIME brings 50 page eye-popping war surpl electronics catalog. Fabulous bargains. Meshna, Lynn, Mas

TOROIDS: Uncased 88 mhy like new. Dollar each. Fi $4.00 P.P. DePaul, 309 South Ashton, Millbrae, Calif.

WANTED: TEST EQP'T TS or AN/URM, UPM, ARN etc. TELETYPE TG-7, Models 15, 19, 26, 28, printe & reperforators, Rcvrs & xmtrs, BC 610E 1; AN/GRC & higher, RT-66, -67, -70, -77, Collins 51J 17L3, -4, 18S- R-388, -390, -391; ARN14 and 30; APR-9, 10, ARC-2 -33, -34, -55; APS-10, -31, -33, -42 etc. We pay freig Amber Industrial Corp., 75 Varick St., New York 13, N.

Convert any television to sensitive, big-screen oscilloscop Only minor changes required. Plan $1.95. Relco Industri Box 10563, Houston 18, Texas.

Multiplex Adapter—Circuit board, set of 5 coils, sockets nd complete instructions $15.00. D. L. Stoner, Box 388Q, Alta Loma, California.

COMMUNICATION. Teletype. Unusual surplus bargains. ree flyer. MDC-923 W. Schiller, Phila. 40.

ndustrial tubes type 5555 $95.00 ea. frequency shift con-erters AN-7 URA-6 frequency shift converters $295.00 or vill swap for other gear. Spera Electronics, 37-10 33 St., .I.C., N.Y.

TV CAMERA—low cost—easily built—complete schem-tics, instrucitons 50¢. Denson Electronics, Rockville, Conn.

WANT FOR CASH:—CQ All 1945 issues; VANTRON Q-Probe; sell or swap QSTs 1939-1959. W4ID 461-3rd Ave., Sea Park, Eau Gallie, Florida.

ALTERNATORS, new, 12V, complete with universal in-tallation kit and transistor regulator. Fully guaranteed. Write for details. 30A unit $49.95, 45A $9.95. Electrocon Corp., 115 Ward Street, Boston 20, Mass.

& 2 METER FM gear. Surplus police units. Receiver trips $15. Transmitter strips $10. Write for details. Two-Way Radio, 115 Ward Street, Boston 20, Mass.

WANTED: Tubes, diodes, transistors, military, com-nercial lab-grade test equipment, components, PRC, GRC, quipment, aircraft equipment by Collins. Top Prices. Write details, Bob Sanett, W6REX, V & H Radio Elec-ronics, 2053 Venice Blvd., Los Angeles 6, California.

FOR SALE: Complete instrucitons including 28 page book-et and 22" x 36" schematic for converting the ART/13 ransmitter to AM and SSB. Satisfaction guaranteed. $2.50. Sam Appleton, 501 N. Maxwell St., Tulia, Texas.

TELEVISION CAMERA KIT, easy to build step by step nstructions, suitable for Ham TV, educational, industrial, Medical uses. Craftsmen Instrument Labs Inc., 60-30 34th Ave., Woodside, L.I., N.Y.

LITTLE GIANT ROTATOR. Will swing any beam 10, 5, 20 or 40 meter. Assemble it yourself for less than 35.00. Gears guaranteed a lifetime. Positive direction ndication. Mount on roof, ground or tower. Easy to fab-icate. Photos, drawings and directions included in package. end $1.50 to Little Giant, P.O. Box 2341, Idaho Falls, daho. Foreign countries, $2.00.

WANTED: Military and commercial laboratory test equip-nent. Electronicraft. Box 399, Mt. Kisko, N.Y.

"BETTER GEAR FOR LESS" is our slogan, and we nean it. PACEMAKERS $239.95. HT-37S $359.95. SX-111s 229.95. All gear has been reconditioned. Send for list. We buy, sell, or trade. H & H Electronic Supply, 506-510 Kishwaukee St., Rockford, Ill.

A-1 reconditioned equipment. On approval. Trades. Terms. Hallicrafters S-1-7, $69.00: S-85, $79.00; SX-99, $99.00; SX-100, $179.00; SX-111, $149.00; SX-101A, $229.00; Ham-narlund HQ-100, $119.00; HQ-110, $169.00; HQ-170, 259.00; Collins, 75S-1, $329.00; 75A-4 $499.00; 32S-1, 499.00; KWS-1, $995.00; Central 10A, $79.00; 20A, 149.00; National Gonset, Elmac, Heath, Johnson, RME, nany others. Write us for list. Henry Radio Company, Butler, Missouri.

WANTED: will trade even-up your choice new factory boxed Hammarlund HQ-180C, HX-50, or Gonset GSB-201 linear mplifier, 2 meter Communicator IV, or 6 meter Communi-ator IV for your clean surplus Collins R-388/URR, -390A/URR, RDR-1B ARC-34, ARC-38, R-220C/ARN-21, 18S-1, 51X-2, 17L-7, ARN-59, also test equipment G-1A/ARN, SG-2/ARN, SG-13 ARN, SG-34/GPM-15 G-66/ARN, ARM-11B, ARM-17, ARM-20, ARM-25, PM-32, UPM-44C, or HP 524, 608D, 618B, 620A, 624C. Vill also give partial trade-in on PRC-8, 9, 10, and RT-68, T-69, 70, RT-77/GRC-9. Lets trade. Bill Slep Company, Drawer 178CQ, Ellenton, Florida, Phone 722-1843.

QUARTZ CRYSTALS: large stocks of miscellaneous fre-uencies and types. Special—FT-243—25 kilocycle steps. 700 to 7000 and 7300 to 7950—50¢ each. Spot frequencies 450 to 8500 kilocycles (.02%)—$1.25. Write for lists. ostage 5¢, each crystal. R. E. Woods Electronics, 2142 arkway, El Monte, California.


## JEFF-TRONICS

R.F. Cable 10' 3" long, RG-8/u with UG-21/u type "N" connector on each end.
4 pounds .....$1.25 .....10 for $10.00

9-pin miniature sockets, yellow bakelite. Made by Cinch or Eby. .....6 for $1.00

Adjustable audio choke, variable from 2½ to 8½ henrys. 1¼" square × 2" high. 900 ohms. Fully encased .....79¢

Antenna relay, ceramic insulated. DPDT, 15 Amp. contacts. 2" × 3" × 1¾", Available with 12 v.d.c. 6 v.a.c., 12 v.a.c., or 115 v.a.c. coil. Specify voltage .....$2.50

Zener diodes, Texas Inst. IN756A, 8.2 volts, 400 m.w. .....$1.00 each.....4 for $3.00

Filament transformer, 2 windings, each 12.6 v., 1 Amp, 115 v. 60 cycle primary. 2¼" × 2" × 2¾", .....3 pounds $1.95

**Coax Connectors — All new, American made — PL-259, 50¢ — SO-239, 48¢ — PL-258 "barrel," 55¢**

**Please add sufficient postage.**
**Minimum order $2.00**
***Send for your copy of our catalog***

**We are distributors of Drake receivers, Hy-gain antennas, Premier chassis & cabinets, Air-dux coils, New-Tronics mobile antennas.**

4791 Memphis Ave. Cleveland 9, Ohio

For further information, check number 30, on page 128

## CALL-IDENT TYMETER©

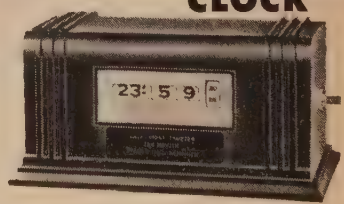
**10-MINUTE STATION CALL REMINDER**

**24 HOUR CLOCK**

#124

**22.50**

Plus applicable taxes



**10-minute repeating timer buzzes warning to sign in your call letters. Walnut or ebony plastic case. H4", W7¾", D4". Wt. 3 lbs. 110V, 60 cy. 1 year guarantee.**

**At Your Dealer, or WRITE TO**

TYMETER ELECTRONICS
**PENNWOOD NUMECHRON CO.**
**7249 FRANKSTOWN AVE., PITTSBURGH 8, PA.**

HAVE YOU SEEN PAGE 6

WALTER ASHE RADIO COMPANY
Dept. C-12-62
1123-25 Pine Street, St. Louis, Missouri
Ok—Wake me up! I am interested in_____
_____
What is the Ashe "Surprise" allowance on_____
_____
Name_____
Address_____
City_____Zone_____State_____
☐ Send New Catalog
☐ Send Reconditioned Bulletin

Want to lay awake at night? That's what happens to the people who write for our trade in quote before they are ready to go.

Don't let our quotes disturb your sleep! Don't clip the coupon unless you can stand the best trade in offer in the business.

PLEASANT DREAMS!

*(Quotes confined to gear made since 1945)*

**Anxious? Call us at CHestnut 1-1125**

**WALTER ASHE RADIO CO.**

**1123-25 Pine St., Dept. C-12-62, St. Louis 1, Missouri**

For further information, check number 29, on page 128


Wanted: Commerical or surplus airborne-ground transmitters, receivers, test sets, 618S, 18S, 17L, 51R, ARN-14, GRC, PRC, ARC-27, ARC, Bendix, Collins, others. RITCO BOX 156 Annandale, Va.

Bargains! Equipment Sold! Traded! Wanted! By other Hams in "Equipment Exchange Bulletin". Interesting sample copy free! Write: Brand, Sycamore, Illinois.

Aluminum for every ham need. Write to Dick's, 62 Cherry Avenue, Tiffin, Ohio, for list of tubing, angle, channel, castings, plain and perforated sheet, and complete beam kits.

Wanted: Army sets or parts—GRC—PRC—FRR/URR—TCC—SB—SCR—Send Listings. Quick cash. Anker Electronics, 1617 So. Main Street, Box 26, Wilkes Barre, Pa.

XMAS TUBE SPECIALS! 2014/6CL6/6197's, 8 for $1.98; 4D32's, $9.95; 815's, $1.98; 872A's, $2.49; 5BP1's, $4.50. Send stamp for complete ham tube listing. Lou-Tronics, Inc., 131 Lawrence St., Brooklyn 1, N. Y.

100 kc r.f. Oscillator Unit, with crystal and oven, accuracy .00015%, Used in SRT-14 transmitter, schematic included. 250 v.d.c.6.3 v.a.c., New in original boxes $20.00 less tubes. $22.00 with tubes, Postpaid, Check with order . . . RITCO Box 156, Annandale, Va.

Detroit distributor offers better cash deals from Collins on down. Volume purchases at old prices permits sale HT-37 $450; 75S-3 $620; SX-101A $369; Clegg 99'er $139; Zeus $595. Write for list! Radio Supply & Eng. Co., Inc., W8VSK Detroit 1, Michigan.

QSL—Cards LOW prices—Free Samples. Debbeler Printing, 1309-C North 38th Street, Milwaukee 8, Wis.

QSL's? WPE's? CB's? America's Finest Samples 25¢ (refunded). *Sackers, W8DED, Holland, Mich.

FREE: Bargain Bulletin. Write: "Meininger Ads," Jesup, Iowa.

QSL CARDS: 2 color, glossy; 100 for $2.50. Samples, dime. Ramsbottom Printing, Box 237F, Kirksville, Missouri.

SPECIAL—500 TWO COLOR QSL CARDS $3.95. HOLLYWOOD PRINTING 1423½ N. MARIPOSA AVE HOLLYWOOD 27, CALIF.

QSLs. Samples, dime. Print Shop, Corwith, Iowa.

QSL's . . . Eyecatching designs . . Dime. Filmcrafter . . . Martins Ferry, Ohio.

QSL's—CBL's—Finest Quality—Extra Fast service on stock or custom designed multicolor cards. Samples and catalogue 25¢ (refundable). Dunnahoo, 516A Prospect, Fairview, Mass.

RUSPRINT QSLs—SWLs 100 2-color glossy $3 postpaid. QSO file cards $1 per 100. Rusprint Box 7507, Kansas City 16, Missouri.

QSL's SWL's XYL-OM's (Sample assortment approximately 9¾¢). Covering designing, planning, printing, arranging, mailing, eye-catching, comic, sedate, fantabulous, DX-attracitng, protopay, snazzy, unparagoned cards. (WOW!) Rogers, KØAAB, 961 Arcade St., St. Paul 6, Minnesota.

QSL's HIGH GLOSSARY CARDS. Send dime for samples. T. H. Lincoln W1IBB, 18 Hovey St., Woburn, Massachusetts.

HUNDRED QSLs: 80¢. Samples, dime. Meininger, Jesup, Iowa.

QSL's SWL's that are different, colored, embossed card stock and "Kromekote". Samples 10¢. Home Print, 241 Elmo, Hamilton, Ohio.

QSL—Kromekote 3-Color . . . order 200 get 25 each of 8 different styles—many styles. Samples 10¢. Progress Printing. Box 1154, Biloxi, Miss.

QSL's four colors glossy stock, forty designs—send $5 for 200 and get surprise of your life. 48 hour service. Satisfaction guaranteed. Costantine Press, Bladensburg, Md.

GLOSSY 3-color QSL cards 100—$4.50. Free samples. Rutgers Vari-Typing Service, 7 Fairfield Road, Somerset, N.J.

SL's-SWL's samples 10¢. Malgo Press, Box 375 M.O., oledo 1, Ohio.

SL's, SWL's, WPE, CB, Samples—5¢. Nicholas & Son, intery, P.O. Box 11184, Phoenix, Arizona.

SL's—Samples 15¢. Rubber stamps: Name, Call, Address $1.35. Harry Sims, 3227 Missouri Avenue, St. Louis 18, issouri.

SL cards—BROWNIE—W3CJI—3110 Lehigh, Allentown, ., Catalogue with samples 25¢.

REATIVE QSL CARDS: Free new catalog and samples. rsonal attention given. Wilkins Creative Printing, P. O. x 1064-2, Atascadero, California.

)—2 color QSL cards $3.95—Giant Log Book—1000 log ms, $6.98 c.o.d. Hollywood Printing 1423½ N. Mariposa, ollywood 27, Calif.

L Cards in 3 colors, $2.50 per 100. Free samples and talogue. Garth Printing, Box 51Q, Jutland, New Jersey.

L's: regular or special. Frier, 21 Harvard, Schenectady. mples 25¢.

SL's 100 $1.25. Free Samples. L. Keller, 3036 Ridgeview, ormandy, Mo.

ANTED: Old wireless gear, tubes, magazines and cata- s before 1925. Amateur or ship equipment only. Please e complete information including price. My purpose is buy this equipment, put it in first class shape and make available either on a museum or demonstration basis to amateurs who didn't live and operate during this era. 5VA, T. Frank Smith, P.O. Box 840, Corpus Christi, xas.

uminum for every ham need. Write to Dick's, 62 erry Avenue, Tiffin, Ohio, for list of tubing, angle, annel, castings, plain and perforated sheet, and com- te beam kits.

LL HIGHEST OFFER: Chicago Transformer potted kes 8 h. 500 mils. 55 ohms 5000 v. ins., 3000-0-3000 v. ., 115 v. pri., 500 mils. sec. Stancor Trans., 3100-0-3100 v. ., 115 v. pri. 700 mils. sec., Amertran Trans., 1500-0-1500 sec., 230 v. pri. 1 amp. sec., Amertran Trans. 2500 watt dulation trans. 1200 ohms pri. 5000—7500 ohms sec. 000 v. ins. 250 watt modulation trans. Chi. Trans. potted 000 ohm pri. 8000 sec. Heath conelrad alarm, BC-221, T 13, AXT TV camera, D-104 mike, JT-30 mike. Tubes: A, 813, 810, 4X150, 4B32, 872, etc. 24 hr. wall clock, nel Train sets, Pennsylvania Electric and New York ntral with deluxe heavy duty trans. 12 yrs. old like new. hase 250 volt 40 amp. output 6 cyl. gas. driven generator Knight deluxe tape recorder, no. 22 enamel copper wire lb. spools, Collin's choke 6 h. 700 mils. 7500 ins. h. duty, nf, and 4 mf 3000 and 4000 wv. d.c. new. Carl Shogren, HXV, 5916 No. Artesian Ave., Chicago 45, Ill.

t Equipment: Ballantine a.c. v.t.v.m. and null detector to 100 volts $125; Simpson Model 260 v.o.m. $20; mpson Model 303 v.t.v.m. $30; RCA Model WV-98B v.m. $45; Hycon Model 615 digital v.t.v.m. $100; Leeds Northrup wheatstone bridge Model 5300 $40.00; Heathkit tage Calibrator $15; Heathkit Electronic Switch $15; mont 208 Oscilloscope $35; TS-34 Oscilloscope $25. ateur equipment: Mark II 30 watt 40 and 80 meter sceiver w/2 power supplys $30; Hallicrafters S-27 v.h.f. eiver 26-148 mc a.m.-f.m. $50; BC-222 10 meter trans- er $15; TBY, 10 and 6 meter transceivers $15; RC-182 set, 500 lbs. of valuable parts $75. Herb Belin, 1078 untain Avenue, Berkeley Heights, N. J.

lins TCS transmitter-receiver 1.5-12 mc 4 channel crystal trolled or v.f.o. with 12 volt dynamotor, mike, cables speaker in mint condition in wooden export box, com- e ready to operate $125. Lloyd Rondeau, 2436 Carney ., Marinette, Wis.

lins 75S-1 for sale—0.5 kc filter—b.f.o. xtal, Perfect-High $350. K2YEQ-57 Melbury Rd. Babylon, L.I., N.Y.

Sale Norelco "Continental 100" tape recorder. Used little, almost new. Will send a list of specifications. 00 or best offer. Fred Haines, Rural Ave., Lewisburg, Pa.

ing 500 factory wired, excellent condition, $475.00, Gone . W8ZAW, Lawrence D. Salee, 5958 Stewart Road, cinnati 27, Ohio.

Vfo-Matic for transceive operation with 75A receivers 9 mc exciters—$90.00 FOB. Lamb, 1219 Yardley Road, risville, Penna.


Are You

**TRADING?**

Let me make you a trade-in offer on your used amateur equipment. All name-brand merchandise—late serial numbers assured. Quick delivery.

WRITE TODAY! Bill W9ZSO-KØIUH

**COMMUNICATIONS EQUIPMENT CO.**

518 State St., LaCrosse, Wis.

Phone 4-7373

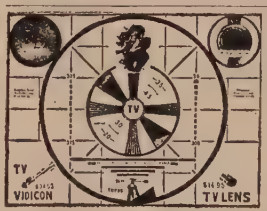
TELCO TAPETONE ELECTRONICS LABORATORIES INC.

99 Elm St., West Newton 65, Mass.

MANUFACTURERS OF ULTRA LOW NOISE PREAMPLIFIERS, R.F. CONVERTERS, AND PARAMETRIC AMPLIFIERS·····

TELEPHONE: (617) 332-1123 TWX: (617) 332-0016

EXPORT: MICROWAVE INTERNATIONAL CORP 36 W. 44TH ST., NEW YORK 36, N.Y. TELEPHONE: YU-6-2738 CABLE: MICROKEN, N.Y.




**TV-CAMERA BUILT AT LOW COST DETAILS 50¢**

DENSON ELECTRONICS CORP.

Box 85, Rockville, Conn.

**ALL BAND AMATEUR RADIO TRAP ANTENNAS!**

Reduces interference and Noise on All Makes Short Wave Receivers. Makes World Wide Reception Stronger. Clearer on All Bands!

For ALL Amateur Transmitters. Guaranteed for 500 Watts Power for Pi-Net or Link Direct Feed. Light, Neat, Weatherproof.

Complete as shown total length 102 ft. with 87 ft. of 72 ohm balanced feedline, Hi-impact molded resonant traps. (Wt. 3 oz. 1" x 5" long). **You just tune to desired band** for beamlike results. Excellent for ALL world-wide short-wave receivers and amateur transmitters. For NOVICE AND ALL CLASS AMATEURS! NO EXTRA TUNERS OR GADGETS NEEDED! Eliminates 5 separate antennas with excellent performance guaranteed. **Use as Inverted V for all band power gain.** NO HAYWIRE HOUSE APPEARANCE! EASY INSTALLATION!

80-40-20-15-10 meter bands. Complete.....$14.95

40-20-15-10 meter bands. 54-ft. ant. (best for w-w swl'g.... 13.95

20-15-10 meter bands. Dual Trap. 24-ft. antenna ..... 9.95

**SEND ONLY $3.00** (cash, ck., mo) and pay postman balance COD plus postage on arrival or send full price for postpaid delivery. Free information available only from:

WESTERN RADIO • Dept. AC-12 • Kearney, Nebraska

**TELETYPEWRITER EQUIPMENT • COLLINS**

**51J-3 and R-390A RECEIVERS Teletype: #14, 15, 19, 26, 28; Kleinschmidt: TT4A, TT76, TT98, etc. Telewriter Receiving Converter, etc. For general information & equipment list, write to TOM, W1AFN *ALLTRONICS-HOWARD CO.*, Box 19, Boston 1, Mass. RIchmond 2-0048.**



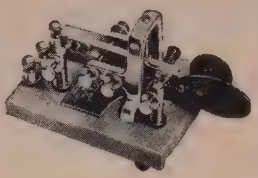
HAVE YOU SEEN PAGE 6

MAKES SENDING A PLEASURE
With VIBROPLEX

No special skill required. Just press the lever — Vibroplex DOES THE REST. All parts precision machined and key is adjustable to any speed. Will not tire the arm. Five models, priced at $17.95 to $33.95.

VIBRO-KEYER

In building electronic transmitting units, Vibro-Keyer supplies the perfect part. With a finely polished base 3½" by 4½" and a weight of 2¾ lbs. Has same contacts and finely finished Vibroplex parts. Standard, at $17.95 DeLuxe, with Chrome Plated Base, priced at $22.45.



Order today at your dealers or direct.
THE VIBROPLEX CO., INC.
833 Broadway New York 3, N. Y.
FREE Folder

HAVE YOU SEEN PAGE 6

FREE GIANT NEW 1963 CATALOG

BURSTEIN-APPLEBEE CO.
SEND FOR IT TODAY
Dept. CQ, 1012 McGee St., Kansas City 6, Mo.
☐ Rush me FREE 1963 B-A Catalog.
FREE
Name .....
Address .....
City ..... State .....

For further information, check number 27, on page 128

160 through 2 combo, heath DX-100 and Viking 6N2 (factory wired) $250 cash or certified check. Will deliver 100 mile radius of Pittsburgh. Roy Miller, Linn Drive, Belle Vernon, Pa.

COLLINS KW-1: serial no. 150, factory converted for SSB, also FSK RTTY optional. Set of new spare tubes, instruction books, exclnt condx, $1995.00. Lester Benson, K4HWF, Box 2832, Pompano Beach., Fla.

For Sale: Collins 51J3 with 1.5 kc and 3 kc mech. filters, $675.00; 75S1, $375; 200V, $675.00; HT-33A modified to "B," 550.00; transistor parameter tester wtih Hewlett Packard 400H v.t.v.m., $375.00, Simpson signal & sweep generator Model 479, $250.00; B & K Model 160 transistor leakage & beta tester, $55.00. All the above in like new condition. S. Gogel, W2FUR, 1096 Laux Pl., N. Bellmore, N. Y. SU 5-6876.

Wanted: 100V or 200V Central Electronics transmitter. State serial, condition, best cash price. Woodring Fryer, 235 Water St., Henderson, Kentucky.

For Trade: A 5 inch Heathkit push-pull oscilloscope and a T5-2 sweep generator in good operating condition for a good 6 meter transceiver or transmitter and converter. Will sell scope and generator without trade. James P. Boxx 2652 Windsor, Owensboro, Kentucky.

For Sale: Health Sixer, never used. Viking Match-Box & Heath s.w.r. meter, Hammarland HQ-170. Best Offer. Bob Gibson, 526 Park, Norman, Okla.

Wanted: SB-10; Marauder; Warrior; Mosley TA-33jr or VPA 20-3. Price & Condition, W3JUO, 1113 Edmonds Ave., Drexel Hill, Pa.

Johnson Viking Thunderbolt kw linear amplifier. Factory wired. Excellent condition $350. Two Eimac 4-1000A tubes, unused. (not Government surplus). $55 each, both for $100. W6IMC, 210 Alden Rd., Hayward, California.

Swap: I have some still-current ham gear-pwr. supplies, modulators, x'mttrs, etc. that I'll swap for pre-1925 BC battery sets. Dave Farmer P. O. Box 506, Cedar Rapids, Iowa.

For Sale—HRO-50 coils AC, A, B, C, D, F, H—Make offer for one or all. Am looking for E coil. DSB-100 $75 Like new. Wells Chapin, 118 Woodmancy Lane, Fayetteville, N. Y.

Want: Good Mimeograph as Gestetner, Rex, A.B. Dick. Also want Johnson Match-Box. Will trade ham items for above. H. Samkofsky, 201 Eastern Pkwy. Brooklyn 38, N. Y.

6N2 Thunderbolt, 2 new extra 4X150A tubes. No scratches. Will ship in original carton F.O.B. Used 10 hours $400.00. K1MND, 31 Hettiefred Rd., Greenwich, Conn. JE 1-7297.

Collins KWS-1. Serial 1030. Spare 4CX250B's $890. W5RKE, 604 Adams, Alamagordo, N. Mex.

For Sale: Lafayette HE-45A 6m transceiver has mike and 117v. a.c. or 12v. d.c. power. Used four hours since purchase. $95 and U ship. Bill Kennamer, K5FUV, 205 Chism, Paris, Arkansas.

Wanted: Parts for R-388; R-390 Receivers or Receivers for cannibalization. Send condition and price to Tilleman, Box 102, Beatty, Nevada.

Sell: HQ-145C $195. WA2ZVJ.

Heath Sixer, 4 el. Telrex, 50' RG-8/U, all excellent condition, $30. K1MLF, 37 Leary, Cochituate, Mass.

National NC-300: with matching speaker and XCU-300 plug in crystal calibrator. Excellent condition $250. Philip R. Wanroy. 903 Ely St., Allegan, Michigan.

DX-100 transmitter. Excellent Condition, $170.00. NC-98 receiver, works but needs slight repair—$100.00. Stephen Cohen, 1900 Quentin Rd., Brooklyn 29, N. Y. Apt. 6D.

Wanted—Tapes for TG-10 Keyer. Send numbers of tapes available and price wanted. W8KMT R. Weaver, Rt. #2, Crestline, Ohio.

HEATH XMTR. DX 40. wired and tested. A1 $39.00. C. Gerst, 4236 W. 36 St., Cleveland, Ohio.

I NEED used commercial or mil version SX-73, 51-J, SP-600 or equivalent receiver. State condx and lowest price in first letter. Box S-9, CQ Magazine, 300 W. 43, New York 36.

WANTED in any condition, RCA 1956 color TV, chassis CTC 5D. 21AXP22A picture tube must be in good shape. Will consider cash or trade. W3ASK.

CANADA. Central Electronics 200 V $950 Hammarlund HQ 180 with new accessory noise silencer $500. Heath Transistor Receiver Mohican, factory aligned, with a.c. power supply $120. all excelelnt condition. Dr. G. A. Asche, VE7AOK, Box 400, Hope, B.C.

FOR SALE: Hammarlund HQ-180, like new w/noise silencer and speaker—Best offer over $260. Brand new, never used RME VHF-126 Tuneable converter, for 50 mc, 144 mc, and 220 mc—Best offer over $150. Write Box CR, c/o CQ. 300 West 43rd St., New York 36, N.Y. or Phone JU 2-4460 and ask for Miss Mark.

FOR SALE: JOHNSON Challenger, 122 VFO, TR Switch and B&W low pass, $125. Also Lafayette He-35 6M transceiver with 6v. power supply, mike, crystal and mobile mounting brackets, $50. K3AXB Box 314, Republic, Pennsylvania.

NC-98 With Speaker, $69. W2EEJ.

FOR SALE: KWM-2 A.C. and D.C. supplies; mobile rack; micro-match; 20 and 40 meter Heliwhips and mount; mike. Little used. K2HEA; 12 Elm St., Lynbrook, N.Y. LY-9-2356.

WANTED: KLEINSCHMIDT TELETYPE, GRC-9 & 10, and R-309A or R-388 Receiver. Will trade ham gear for or military surplus. George, KH6CSL/2, Box 96, Morrisonville, N.Y.

## Packaged Power on 6 [*from page 120*]

variations in 5763 grid current will provide a clue to these phenomena. Wider staggering of $L_1$-$L_4$ will produce a broader bandpass, but is not recommended because of the accompanying loss of grid current.

STEP 10—Connect a low impedance antenna to $J_2$, set the transmitter frequency to any convenient point in the operating range, set $S_2$ to read 6146 plate current, leave $S_3$ in TUNE position, and reresonate $C_6$.

STEP 11—Set $S_3$ to C.W. position, press the key, and rapidly check $C_6$ for resonance. Alternately decrease the capacity of $C_7$ and reresonate $C_6$ until the 6146 is loaded to 120-130 ma. When the key is opened, clamp tube action should hold plate current down to 20-25 ma (with a 500 volt supply).

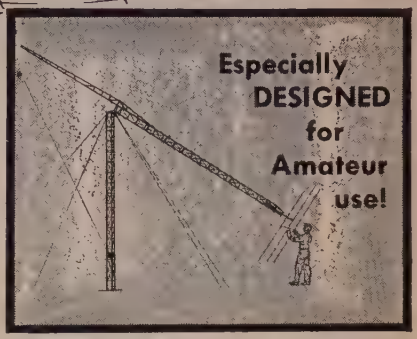
STEP 12—Check again for a v.r. current of 5-10 ma at point "X" with the key closed (the closer to 10 ma the better), or verify visually that the lower 0B2 barely remains lighted under these conditions. Adjust $R_{10}$ as necessary, and tighten the slider. If a meter was used at "X," remove it and make a permanent ground connection.

STEP 13—Connect the modulated plate line, set $S_3$ to PHONE position, set $S_2$ to read 6146 plate current, and apply power. If necessary, re-adjust $C_7$ and $C_6$ for a loading of approximately 110 ma.

### Final Precautions

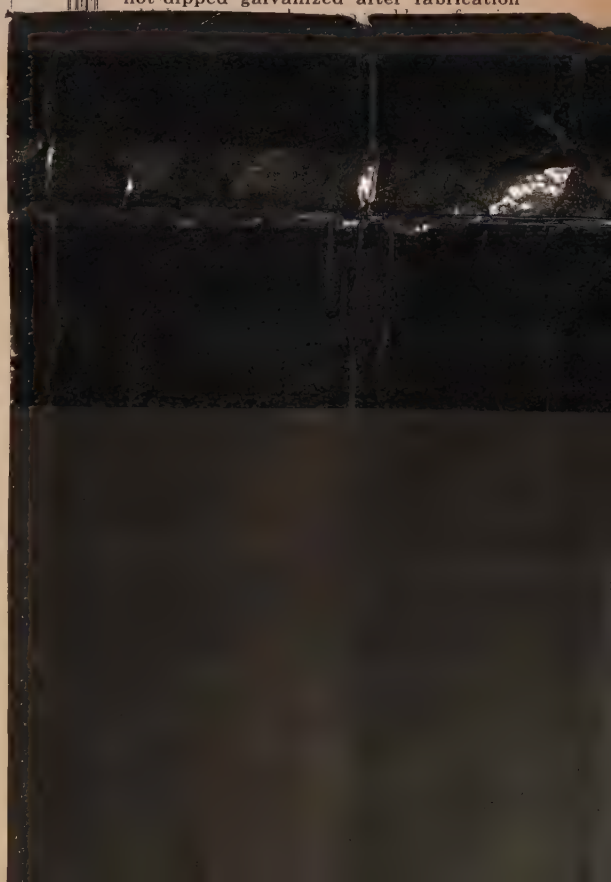
Two final precautions are standard with this writer. First, don't use this or any other pi-network rig without an antenna coupler or low-pass filter. In its present form, a corruption of the original Collins pi-network tank, the circuit cannot provide the harmonic suppression required by the FCC. Second, if there are any small children or curious pets in the household, cover the high voltage terminals at the rear of the transmitter with some kind of safety shield. ■

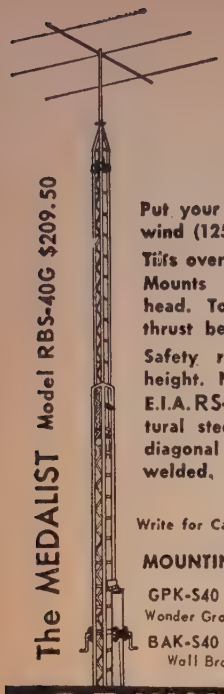

ROHN "*fold-over*" TOWERS*




*first* IN DESIGN *foremost* IN SALES

ROHN "fold-over" towers are ESPECIALLY made for amateur use. They are the most practical tower in design because they allow you to work ON THE GROUND for antenna maintenance and servicing. You'll quickly agree that this is a most wonderful feature for an amateur tower. In addition, these towers are made and designed for true, heavy duty use. They are structurally sturdy for use up to 70 feet and in enough sizes for *all* types and sizes of amateur antennae. This means that they can easily handle your requirements. They have unexcelled workmanship. They are hot-dipped galvanized after fabrication





The MEDALIST Model RBS-40G $209.50

# STURDY
## E-Z WAY TOWERS

Put your Tribander at 41' in 70 mph wind (125 mph cranked down to 24').

Tilts over for E-Z access to array.

Mounts Ham-M Rotor inside tower head. Top radial bushing • vertical thrust bearing.

Safety rest locks tower at desired height. No weight on cables.

E.I.A. RS-222 specs. Heavy wall structural steel tube legs, solid steel rod diagonal & horizontal bracing — arc welded.

*Sold by Top Flight Distributors Everywhere!*

Write for Catalog 22-1

MOUNTING KITS:

GPK-S40 $75.00 Wonder Ground Post

BAK-S40 $10.50 Wall Bracket

$169.50 MODEL RBS-40P. Dip painted

**E-Z WAY TOWERS, Inc.**

P.O. BOX 5767 • TAMPA 5, FLORIDA

For further information, check number 55, on page 128


# CQ ADVERTISER'S INDEX


??????????  6
Allied Radio Corporation  130
Alltronics-Howard Company  125
Amateur Electronic Supply  84, 108, 109, 113, 117, 121
Ashe, Walter Radio Company  124
Astatic Corporation  16

Barker & Williamson, Incorporated  116, 120
Barry Electronics  110, 111
Bendix Corporation  102
Burstein-Applebee Company  126

C & G Electronics Company  106, 119
Centralab  20
Cleveland Institute of Electronics  13
Collins Radio Company  Cover II
Communications Equipment Company  125
*Cowan Publishing Corp.*
CQ Anthology II  129
Ham Mart  115
Ham Shop  122
Reader Service  128
Subscription  112A

Denson Electronics Corp.  125
Dow-Key Company, Incorporated  116, 119
Drake, R.L. Company  15

E-Z Way Towers, Incorporated  128
EICO Electronic Instr. Co., Inc.  9

Fair Radio Sales  114
Finney, The Company  99

Gonset Company  24, 25
Gotham  82
Grand Central Radio Inc.  118

Hallicrafters Company  2, 4, 5
Hammarlund Manufacturing Company  10
Harrison Radio Corporation  114
Harvey Radio Company, Incorporated  103
Heath Company  26, 27
Hy-Gain Antenna Products  22, 23

International Crystal Manufacturing Co.  11
Instructograph Company  118

J & D Labs  98
Jeff-Tronics  123
Johnson, E.F. Company  12

Lafayette Radio  105
Lampkin Laboratories, Incorporated  127
Lattin Radio Labs  118, 119
Lee, Bob  99

Millen, James Mfg. Co., Inc.  14
Mosley Electronics, Inc.  8

National Radio Company, Incorporated  Cover III
New Products  116
New-Tronics  18

P & H Electronics  98
Pacific Plantronics  17
Pennwood Numechron Co.  123
Penta Laboratories, Incorporated  19
Petersen Radio Co. Inc.  1

RCA (Electron Tube Div.)  Cover IV
Radio Amateur Call Book, Inc.  122
Radio Shack Corp.  120
Raytronics  107
Rohn Manufacturing Company  127

Shure Brothers, Inc.  21

Tapetone Electronic Laboratories, Inc.  125
Telrex Laboratories  119
Texas Crystals  104
Transceivers, Inc.  112
Tri-Ex Tower Corp.  21
Tristao Towers, Inc.  119

U.S. Crystals, Inc.  122

Vibroplex Co. Inc.  126

Western Radio Co.  125
World Radio Labs Inc.  107

# Available for December Delivery

## The New CQ Anthology II...

## Covering 1952 Thru 1959

- ***250 Pages, Plus***
- ***75 Top Articles***

### *Featuring*

SECTION I . . . Improving Equipment

SECTION II . . . VHF

SECTION III . . . SSB

SECTION IV . . . Surplus

SECTION V . . . Mobile

SECTION VI . . . Transmitters & Receivers

SECTION VII . . . Theory

SECTION VIII . . . Operating

SECTION IX . . . Test Equipment

SECTION X . . . RTTY

SECTION XI . . . Amateur History

### *Including:*

- A Poor Ham's Power Plant. *By Boelke*
- Converting the BC-603 For Six. *By Grayson*
- Ham TV. *By Stoner*
- Converting The ARC-4 For Two. *By Wood*
- Why And How On Six. *By Burdine*
- DX-100 Modernized For SSB, AM And CW. *By Mitchell*
- Second Guessing The Experts on The HQ-129X. *By Santangelo*
- DX-35 Improvements. *By Haburton*
- Converting The BC-659. *By Grayson*
- Filter Alignment Equipment. *By Scherer*
- SSB: Is It Really Better Than AM? *By Costas*
- Teletype Without Tears. *By Wells*
- Transistorized VFO. *By Scherer*
- An Unusual SSB Modulator. *By Orr*

C-12

CQ BOOK DEPT.
300 West 43 St.
New York 36, N. Y.

☐ Anthology I $2.00

☐ Anthology II $3.00

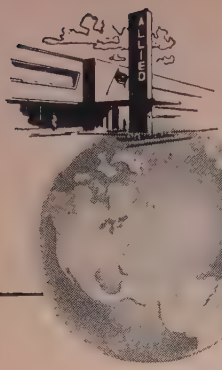
☐ I enclose $..... for the items checked above. Please mail post-paid to:

Name .....

Address .....

City ..... Zone..... State.....

*N. Y. City Residents Add 3% Sales Tax.*



# *Holiday Greetings*

*to all our Ham Friends the world over*

*from the* **ALLIED** *Ham Shack*

**W9WHF**
Jim Sommerville
*(Ham Division Manager)*

**W9NNR**
Ron DeMarco
*(Trades & Tech Help—Mail or Phone)*

**W9QBB**
Tasker Day
*(Ham Shack)*

**K9LOK**
John Chass
*(Ham Shack)*

**W9HLA**
Joe Gizzi
*(Ham Shack)*

**K9WLB**
Lou Green
*(Ham Shack)*

**K9KVQ**
Rodger Nordlund
*(Ham Shack)*

*In Milwaukee*
**W9NGV**
Lowell Warshawsky

*In Milwaukee*
**W9VOB**
Burt Fischel

*In Milwaukee*
**WN9AWB**
Neil "Bud" Cain

## *and from all the gang (over 60-strong) at Allied*

| | | | | | |
|---|---|---|---|---|---|
| W9CCW | R. Ackermann | K9OAL | Dave Gunzel | K9ZWK | Emmett Paschke |
| W9VQD | J. Baird | WAØEBO | Brian Harris | W9ENK | Robert Patejunas |
| K9AVU | Marcell Bell | K9GTK | Thomas Ivas | W9UWM | Cliff Ratliff |
| W9WOV | George Bercos | K8ZRA | Lee Jackson | K8HAH | Fred Rekich |
| K9KWY | Sherwin Berger | WN9BTL | Don Janis | W9NPF | Donald Rossi |
| K9MDM | Theodore Bleiman | W9BBH | R. E. Jankauski | W9KUV | Seymour Sabitt |
| W9BUD | Larry Blostein | K9GHI | William Johnson | K9EIL | Don Saxon |
| K9CDJ | Joel Bolker | KØBYU | Charles Kaiser | W9VES | Phil Simmons |
| W9THG | Leo Borek | WA9ACE | Arnold Klein | K9KBM | Dave Sims |
| K9WZE | Gordon A. Cooley | W9VHI | Don Kobiljak | W9OCG | Rich Stiebel |
| WN9CNV | Pauline Course | W9ARB | Nort Lang | K9OKD | Wayne Strahl |
| W9TTQ | Gerald Dahl, Jr. | WN9EVD | Leslie Levin | K9SRW | David Thornburg |
| W9SFW | Lou Dezettel | K9TTF | Mike Levine | K9BDF | Jay Thomas |
| K9GSB | Norman Eastman | W3LXC | Leon Lutz | W9ZJU | "Doc" Towler |
| K9GSA | Norman Eastman, Jr. | K8YUK | James Marker | W9YPC | Charlie Vaughn |
| K9OEP | William Eiland | W9RND | Jack Matin | K9HOB | Don Wisniewski |
| W9DCB | Milton Fojtik | K9KWT | Robert Oatley | K9IOU | Thomas Weismant |
| W9FDI | Marvin Garber | WA9DNW | Tom Orzech | K9GXK | Jack Wolfson |

*serving the Amateur since 1921*

**ALLIED RADIO**

100 N. WESTERN AVE., CHICAGO 80, ILL.

# Index To *CQ* Vol. 18,—1962

## AERIALS, ANTENNAS, TOWERS, TRANSMISSION LINES


APX-6 Radiators (Katz, K2UYH) ..... 91, Dec.
Antennas For Crowded Locations (Novice) ..... 82, Nov.
Balun From TV, A V.H.F. (Math, WA2NDM) ..... 98, Dec.
Balun, 300 To 75 Ohms (vhf) ..... 71, Dec.
Beam Installation Techniques (Waters, W2JDL) ..... 30, Apr.
Building and Using The Coax Phase Detector (Geiser, WA2ANU) ..... 24, Jan.
Combination S.W.R. Bridge and Amplifier Linearity Indicator, A (Sherrod, W5ZG) ..... 22, Oct.
How's Your Antenna? (Magnusson, WØAGD) ..... 27, Jan.
L.F. and V.L.F., A New Challenge (Selwyn, W2GFR) ..... 26, May
Mark III DX Antenna, The (Lee, W3JHR) ..... 43, Dec.
Measure Antenna Gain, How To (Brown, W6HPH) ..... 40, Nov.
Multiband Quads (Moxon, G6XN) ..... 53, Nov.
Optimum Antenna Design For DX (Lee, W3JHR) ..... 49, Nov.
Portable 6 Meter Antenna, A (Heller, K3HNP) ..... 99, Nov.
Prop-Pitch Motor Antenna Rotator, An Improved (Parsons, VE3QA) ..... 128, Nov.
Protective Coatings For Antennas (Agrelius, K6SHA) ..... 43, Nov.
Remote Control Antenna Switch, A (Guzick, W5BGP) ..... 26, Mar.
Selection and Feeding of Vertical Antennas (Ham Clinic) ..... 80, Mar.
Self Supporting Antenna Mast, A (Haviland, K3BGX) ..... 44, Nov.
Sterba Curtain For The Low Bands, A (Cousins, VE1TG/W6) ..... 47, Nov.
Temporary Splicing of Coaxial Cable (Hunter, W8TYX) ..... 42, May
Tower Construction (Marriner, W6BLZ) ..... 50, June
Transmission Line Quiz (Drummeller, W5EHC) ..... 41, Sept.
Two Meter Beam, A Four Element (Novice) ..... 67, Dec.
V.H.F. Beams From TV Antennas (Myers, W5KKB) ..... 44, Mar.
Vertical Coaxial Antenna (Ham Clinic) ..... 74, May
V.S.W.R. Discussion (Answerman) ..... 94, Dec.
What's Wrong With A Hertz? (Howell, W6MTY) ..... 36, May
Correction ..... 116, July
20 Meter Mini-Dipole, A (Posklensky, K2EEE) ..... 49, Mar.
20 Meter Tower Mounted "Bird Cage," A (Farinet, W8PYL) ..... 43, June
30 Meter Vertical Beam, A (Dixon, W9OKN) ..... 52, July
75 Meter Whip, An Economical (Amico, K8IQM & Piesich, W3ZWH) ..... 44, Feb.
80 & 40 Meter Inverted V, An (Zawacki, K8LTU) ..... 32, Mar.


## AUDIO AMPLIFIERS—MODULATION


Audio Filters For C.W. Reception (Landahl, W5SOT) ..... 45, Jan.
Dynamic Speaker To Microphone (Ham Clinic) ..... 36, June
EL-8 Roundup, An (Stoner, W6TNS) ..... 46, July
Modulation Discussion (Novice) ..... 82, May
Modulator For Low Power Rigs, A (Novice) ..... 84, June
Modulation "Punch" (Ginsberg, WA6NFI) ..... 99, Nov.
Modulator You Can Build, A (Novice) ..... 76, Jan.
Plate Modulating The DX-40 (Ham Clinic) ..... 89, Feb.
Practical Taylor Modulation, Oct., 1961, p. 80, Correction ..... 84, Feb.
Rebirth of the Negative Peak Modulation Indicator, The (Wanamaker, WA2EJJ) ..... 56, June
Speech, A High Level (Ham Clinic) ..... 66, Dec.
Transistorized 1 Kc Oscillators (Ham Clinic) ..... 64, Oct.
Transistorized Modulator, An Economy (Nogle, W5TJT) ..... 51, Dec.
Tunable Audio Slot Filter, A (Davis, K5RKJ) ..... 35, Oct.


## COMMERCIAL EQUIPMENT


Collins 62S-1 S.S.B. Adapter (vhf) ..... 61, Sept.
Eico 730 Modulator-Driver Kit, *CQ* Reviews: The (Aurick, K3QAX) ..... 46, Apr.
Eico 723 Transmitter, *CQ* Reviews: The (Aurick, K3QAX) ..... 54, Mar.
Heath GC-1A Receiver Kit, *CQ* Reviews: The (Stoner, W6TNS) ..... 44, May
Heath HW-20 "Pawnee," *CQ* Reviews: The (Stoner, W6TNS) ..... 37, Nov.
Heath IM-30 Transistor Analyzer (Semiconductors) ..... 83, Jan.
International Crystal TRC-5B 2 Meter Converter (vhf) ..... 91, June
Knight-Kit V.T.V.M., The (Ham Clinic) ..... 91, Aug.
Millen 90932 Scope (Ham Clinic) ..... 72, Jan.
Multi-Elmac AF-68 Trans-Citer, *CQ* Reviews: The (Seidman, K2BUS) ..... 61, Feb.
National NC-105 Receiver, *CQ* Reviews: The (Meyer, W2UJJ & Seidman, K2BUS) ..... 38, Sept.
Sprague Suppressikit (Ham Clinic) ..... 35, June


## COMMERCIAL EQUIPMENT MODIFIED


Central Electronics 10B/20A Modifications (vhf ssb) ..... 99, Dec.
Collins 32S-1 Operating Improvements (Kreager, W6UYW & Gonsior, W6VFR) ..... 47, Aug.
Collins 32V Series TVI (Ham Clinic) ..... 65, Oct.
Collins 75A-4, Update The (Sideband) ..... 76, Nov.
Hammarlund HQ-120 & HQ-129X, Dials For The (Ham Clinic) ..... 72, Jan.
Heath DX-40 To 6 Meters (Ham Clinic) ..... 72, Jan.
Heath DX-40 To 6 Meters, Converting The (Ham Clinic) ..... 32, June
Improving Old Receivers (Ham Clinic) ..... 65, Sept.
Motorola FMTU30D On Two, Putting The (Seibert, W5VLE) ..... 130, Nov.
National NC-183, Biography Of A Modified (Beaty, W6WNR) ..... 52, Mar.
National NC-190 Wiring Corrections (Ham Clinic) ..... 80, Mar.
S.S.B. Reception With A.M. Receiver (Selwyn, W2GFR) ..... 37, Oct.
Correction ..... 18, Nov.


## CONTESTS—OPERATING


Armed Forces Day, Announcing ..... 33, May
Asian DX Contest, Results of the 2nd (Contest Calendar) ..... 82, July
Awards Available By State (usa-ca) ..... 100, Oct.
CHC/HTH Contest, Results of the 1962 (Contest Calendar) ..... 57, Oct.
*CQ* Annual S.S.B. DX Contest Rules (Sideband) ..... 58, Jan.
Claimed Scores (Sideband) ..... 56, Sept.
Results (Strauber & Strauber, K2HEA & K2MGE) ..... 30, Oct.
*CQ* Annual 160 Meter Contest, Announcing (Contest Calendar) ..... 67, Feb.
Results (O'Brien, W2EQS) ..... 39, Aug.
*CQ* World Wide V.H.F. Contest, Rules of the ..... 79, Apr.
*CQ* 1961 World Wide DX C.W. Contest
Claimed High Scores (Contest Calendar) ..... 68, Feb.
Preliminary Report (Anzalone, W1WY) ..... 63, Feb.
Results (Anzalone, W1WY) ..... 64, June
*CQ* 1961 World Wide DX Phone Contest
Claimed High Scores (Contest Calendar) ..... 63, Jan.
Preliminary Report (Anzalone, W1WY) ..... 63, Apr.
Results (Anzalone, W1WY) ..... 47, May
*CQ* 1962 World Wide DX Contest Rules ..... 42, Sept.
Helvetia 22 Contest, Results of the (Contest Calendar) ..... 90, Jan.
REF Contest, Results of the 1961 (Contest Calendar) ..... 66, Mar.
SSBARA WAS Contest, Results of the (Sideband) ..... 72, Feb.
USA-CA Rules and Program ..... 84, Mar.
*VHF Amateur* VHF Contest, Results of the July, 1962 (Brown, K2ZSQ) ..... 97, Nov.
VK/ZL 1961 Contest Results (Contest Calendar) ..... 83, July
WAE 1962 Contest Results (Contest Calendar) ..... 52, Sept.
YL VHF Contest, Announcing (yl) ..... 95, Apr.
YL-OM 1962 Annual Contest
Rules (yl) ..... 92, Feb.
Winners (yl) ..... 101, July
YLRL Howdy Days Contest (yl) ..... 98, Aug.

YLRL 1961 Anniversary Party Results (YL) .....96, Mar.
YLRL 1962 Anniversary Party Announcement (YL) .....80, Oct.

## DX & DXPEDITIONS

Caribbean Caper—PJ5MA (Archibald, K2AAC) ..41, Feb.
Honor Roll, *CQ* Awards .....60, Nov.
DXpedition To Africa (McKercher, WØMLY)
Part I .....57, Aug.
Part II .....29, Sept.
Part III, Conclusion .....27, Oct.
DXpedition To HV1CN (LeKashman, W9IOP) ....37, Apr.
Return To Aves Island (Peña, YV3BS) .....35, Aug.
Six Weeks In The Sun: FK8, YJ1, FW8, And VR2 (Hemple, VK3AHO) .....39, Dec.
WAZ Lament (DX) .....55, Apr.
80 and 40 Meter S.S.B. DX (Leonard, W2SKE) ....60, Jan.

## FICTION

Day In The Life Of A Ham, A (Sutcliffe) .....38, July
DXing Is Different In 6 Land (Cates, WA6GER) ..41, Jan.
DXpedition To The Rare One (Orr, WØWET) ....56, Mar.
Evolution Of The Simplest Rig (Dart, W6RTE) ...40, Sept.
HAM-lets (Worthington, G3COI) .....33, Sept.
If The Bard Were On 20 Today (Bernstein, WA2DEL) .....36, Oct.
One Knob Madness (Worthington, G3COI) .....46, Aug.
QRS (Sarafan, WA2NZE) .....94, Nov.
VHF Contest, The (Fruchter, WA2DCM) .....55, Dec.
Zener Diode Transmitter, A (Gitchagoome) .....52, Apr.

## HAM CLINIC

**January, page 72**
BC-221 Frequency Meter
Crystals and Crystal Oscillators
Frequency Stability
Galvanic Corrosion
Ground Wire Size
Hammarlund HQ-120 & HQ-129X, Dials For The
Heath DX-40 to 6 Meters
Mercury Battery Storage
Millen 90932 Scope
S.S.B. Exciter Power
S.S.B. Linear
SX-71 Improvements
Static
900 Watts On Six Meters
**February, page 81**
Code Speed
Commercial Receiver Discussion
Doublet Matching
Electrolytic Information
Extra Class Licensing
Heath DX-40 Plate Modulation
Heath Warrior Bias
I.F. Transformers, Permanently Tuned Ceramic
Phone Patch Connections
Stray R. F.
Taylor Modulation Rig Corrections
Transistor R.F. Power Amplifiers
**March, page 80**
Book Review:
*Giving Two-Way Radio Its Voice*
Mobile Receiver Supply
National NC-190 Wiring Corrections
Power Line Interference
S.S.B. Test Oscillator
Selection and Feeding of Vertical Antennas
Tape Recorder Intermittent
Tube Trouble (Gas)
T-23/ARC-5 To 2 Meters
**April, page 84**
Book Review:
*RCA Power Tubes*
Coaxial Vertical
KWM-2 and Window Vertical
Mercury Switch "I"
Parallel Antennas
Relay Application
Transistor Power Supply Noise
**May, page 74**
Amperex 8117 For S.S.B.
Collins 32V Modifications
Heath AR-3 Receiver Bandspread
Heath TX-1 V.F.O. Chirp
Mobile Antenna Resonance
Multi-Tester Trouble
Scope Shielding
Speaker Matching
Student Science Fair Projects
Taping Inaccessible Leads
Telephone Pickups
Transistor Tape Recorder Trouble
Vertical Coaxial Antenna
**June, page 26**
"Adapt-O-Citer," The
"Bobby Pin" Heat Sink
"Boiling" Capacitors
Combo B.F.O. *Q*-Multiplier, The
Doppler-Shift Calculator
Dynamic Speaker To Microphone
Flashes In Oscilloscopes
Fuse-OUT Indicator
Hammarlund HQ-100 C.W. Performance
Hammarlund HQ-110 A.V.C.
Hammarlund HX-500 Modifications
Hammarlund S-200 Speaker Response
Heat Dissipating Plate Caps
Heath DX-40 To 6 Meters, Converting The
Heath SB-10 and 50 Mc Converter-Transmitter
Ignition Noise
KE-93 B.F.O.
Knobs For Small Shafts
LASERs In Brief
Open-Wire Line Radiation
Popular Article Index
*Q*-Multiplier Frequency, Changing
Tips For Techs
Tube Tester Information
Wire Stripper
Zener Diode vs V.R. Tube
2 Meter Spurious Signals
220 Volt Transformers On 110 Volts
**July, page 78**
Book Review:
*A Pictorial Album of Wireless and Radio, 1905-1928*
Current and Voltage Feed Defined
F.M.ing on A.M.
G.E. Compactron 6146
Hallicrafters HA-1 Keyer Tone
Heath Apache-Warrior-SB-10 & Phone Patch
Heath DX-60 Loading
High S.W.R.
Home Brew vs Commercial Gear
Low Regulated Voltages
Miniature C.R. Tube
Silicon Diode Checker
21 Mc Power-Line Filter
**August, page 91**
Determining Transistor Beta
Outdoor Antenna Supports
Panel Meter Needle Sticks
Ratings and Characteristics of Transistors
Series-Diode Noise Limiter
**September, page 65**
Book Review:
*G.E. Transistor Manuel*
Collins 32V-2 on MARS Frequencies
Collins 75A-4 Runs Hot
Experimental Radio
Heath DX-60 Keying
Heath HA-10 Noise Generation
Heath HX-10 Grid Current
Improving Old Receivers
National VFO-62 Drift
National VFO-62 Increased Output
Pin Straightener
RCA Application Notes For Nuvistors
V.F.O. Chirp
**October, page 64**
Collins 32S-1 & 75A-4 Sidetone
Collins 32V Series TVI Improvements
Heath DX-60 Audio Hum
Heath DX-60 Distortion
Heath DX-60 Drive Control Peaks On 80
Heath DX-60 Fuse Blowing
Heath DX-60 Loads Only On 40
Heath HW-10 & HW-20 Alignment

National NC-155 & NC-190 Hum
National Manual Service
Plug-In Silicon Rectifiers
Transistorized 1 Kc Oscillators
Troubleshooting Receivers
vember, page 71
'Adapt-O-Citer," More On The
Blown Line-Filter Components
Heath GW-21 To 10 Meters
ohnson Invader & Invader 2000, Updating
RDF Fixes
VRL Vertical Test
cember, page 65
A. F. Oscillator Calibration
Heath DX-40 Additions
Heath TX-1 Modifications
ohnson Messenger To 10
afayette HE-29B Modifications
Speech Clipper, A High Level
Tape Recorder Keyer System

## HAM HINTS

tomobile Trunk Organizer ..... 33, Jan.
n't Tear—Cut Plastic Tape ..... 62, July
od Gun Tip Guard ..... 93, Mar.
ndy Hole Enlarger ..... 56, Dec.
ngers For Pencil Soldering Iron ..... 53, Mar.
e Those Battery Connectors ..... 51, Mar.
ol Handle Insulations ..... 49, June
eful Parts From Inhaler ..... 37, Sept.

## KEYING, BREAK-IN AND CONTROL CIRCUITS

The Air Timer, An (Myers, W5KKB) ..... 35, Apr.
wer Supply Safety Techniques (Barton, V6JAT) ..... 34, Mar.
ay Applications (HAM CLINIC) ..... 84, Apr.
note Control Antenna Switch, A (Guzick, V5BGP) ..... 26, Mar.
mple Transmitter Control Panel, A (Amis, V7RGL) ..... 50, Apr.
rratron Operated Phone Patch, A (Teutschbein, W4LAV) ..... 42, Jan.
nsmitter-Receiver Control Circuits (Green, V3IKH) ..... 30, Jan.
I.F. Man's Control Unit, A (Turner, K7MRB) .. 37, Aug.

## MISCELLANEOUS: GENERAL

ateur Licensing (NOVICE) ..... 82, Aug.
ore It's Too Late (Broderick, K2ZHN) ..... 47, Jan.
atman Day, Mel (W5AWT) (USA-CA) ..... 74, Oct.
net, Ed, W8OVG ..... 70, Oct.
lins Wins Navy Citation, Art ..... 42, May
nmercial Commotion ..... 91, Dec.
coster, Jean P., 9U5MC ..... 100 Aug.
nium Queries: Crossword Puzzle ..... 45, Mar.
nium Queries: Roundword Puzzle ..... 41, May
ergency Phone Patch: KØYMC ..... 40, Feb.
st "KC4," The (Barrett, W6CKF) ..... 50, Mar.
y, Henry, W2MAF ..... 97, June
m Hospitality-South American Style (Hoover, K9AMD) ..... 43, Mar.
mdom's Top Honors From An Iron Lung (Evans, K6BX) ..... 33, Nov.
me Brew vs Commercial Gear (HAM CLINIC) .... 78, July
w Do You QSL? (DX) ..... 51, Oct.
w To Receive QSL Confirmations (Grady, 4TUA) ..... 46, June
orrection ..... 116, July
oduction to V.H.F. (Heller, K3HNP) ..... 95, Nov.
1CC, Camp Century (Cruse, W4TDT) ..... 55, July
vful and Ethical Procedures Applying to adiotelephone Operation (Drummeller, W5EHC) ..... 48, Apr.
orrection, (LETTERS) ..... 12, July
rning The Code (NOVICE) ..... 70, Oct.
nneapolis Style Transmitter Hunt, A (Orr, VØWET) ..... 45, July
ervations From Abroad (Longerich, W2GQY) .. 46, Mar.
eration Exodus (Langelo, K2CMN) ..... 61, July
Of The Darkness (Wood & Lake) ..... 38, May
ular Article Index (HAM CLINIC) ..... 27, June

Project OSCAR: A Report, Its History and Future (Jacobs, W3ASK) ..... 30, Feb.
Rescue Of The Sleeping Driver (Irish, WØWHL) .. 57, Mar.
**Schoeppel, Andrew F. 1894-1962** ..... 29, Apr.
"Something Must Be Done" 20 Meter S.S.B. Operation (SIDEBAND) ..... 90, Apr.
Space Age Radio Amateur—ZE5JJ, A (Spaulding, W6BAF) ..... 43, Oct.
Speedy QSO File, A (Smith, W8VVD) ..... 62, June
Student Science Fair Projects (HAM CLINIC) ..... 74, May
Tips On Working Mobile Stations (Milius, W4NJF) ..... 54, Apr.
USA-CA Certificate Unveiled (USA-CA) ..... 73, July
Vacation With A Purpose ..... 43, May
Voice of America Amateur Radio Program ..... 54, Dec.
**Warne, Clyde, XE1IG** ..... 97, June
YL Net Directory (YL) ..... 86, Nov.
1913 Radio Amateurs (ANNOUNCING) .... 16, Apr.; 12, Oct.
4U1ITU—Amateur Radio Station of the International Telecommunications Union (Jacobs, W3ASK) ..... 34, Sept.

## MISCELLANEOUS: TECHNICAL

Audio Filters For C.W. Reception (Landahl, W5SOT) ..... 45, Jan.
Burgle-Proof Your Mobile Installation (Freedman, K2DEM) ..... 38, Mar.
Cathode Followers & Phase Inverters (NOVICE) .... 76, Jan.
Coax Phase Detector Works, How The (Geiser, WA2ANU) ..... 62, Aug.
Coaxial Cable, Temporary Splicing of (Hunter, W8TYX) ..... 42, May
Code Oscillators (NOVICE) ..... 72, Sept.; 70, Oct.
Combo B.F.O.—*Q*-Multiplier, The (HAM CLINIC) .. 28, June
Crystals and Crystal Oscillators (HAM CLINIC) ..... 72, Jan.
Eliminate Overload! (Heller, K3HNP) ..... 88, Dec.
FL-8 Roundup, An (Stoner, W6TNS) ..... 46, July
Galvanic Corrosion (HAM CLINIC) ..... 72, Jan.
Gated A.V.C. System for S.S.B., A.M. and C.W., A (Amodeo, W2PCJ) ..... 36, Sept.
Harmonic Crystal Oscillator Design (Mickey, W2LCB) ..... 29, July
I.F. Transformers, Permanently Tuned Ceramic (HAM CLINIC) ..... 81, Feb.
Instrument Deluxe, The (Geiser, WA2ANU) ..... 47, Oct.
Kilowatt R. F. Transistors (Stoner, W6TNS) ..... 64, Aug.
Kit Transmitters Work, How (Geiser, WA2ANU)
Part I ..... 36, Feb.
Part II, Conclusion ..... 39, Mar.
*L-C* Box, The (Tartas, W2YKT) ..... 27, Sept.
L.F. and V.L.F., A New Challenge (Selwyn, W2GFR) ..... 26, May
Local-GMT "Two-Timer," A (Drozdiak, W6LDO) ..... 47, Mar.
Measure Antenna Gain, How To (Brown, W6HPH) ..... 40, Nov.
Modulation Discussion (NOVICE) ..... 82, May
Negative Peak Modulation Indicator, Rebirth of the (Wanamaker, WA2EJJ) ..... 56, June
On The Air Timer, An (Myers, W5KKB) ..... 35, Apr.
One Tube, 30 Watts (Marriner, W6BLZ) ..... 26, Aug.
Optimum Antenna Design For DX (Lee, W3JHR) 49, Nov.
Power Supply Discussion (NOVICE) ..... 78, Feb.
Practical Pi-Network Design Data (Marriner, W6BLZ) ..... 44, Aug.
Project OSCAR: A Report, Launch Details and Technical Data (Stoner, W6TNS) ..... 24, Feb.
*Q*-Multiplier Frequency, Changing (HAM CLINIC) . 28, June
R. F. Indicator (NOVICE) ..... 72, Sept.
Ratings and Characteristics of Transistors (HAM CLINIC) ..... 91, Aug.
Relay Application (HAM CLINIC) ..... 84, Apr.
Reverse Tropo?, What Is (VHF) ..... 73, Nov.
S.S.B. Generation, The "Third Method" of (SIDEBAND) ..... 66, Oct.
S.S.B. Phasing For 2 Meters, Direct (VHF) ..... 79, Aug.
"Scan-Pan" Panoramic Adaptor, The (Johnson, ZL2AMJ) ..... 28, Aug.
Shadow Reception (Kelly, W5CYG) ..... 52, Dec.
Signal Losser, A (SIDEBAND) ..... 89, July
Simple Transmitter Control Panel, A (Amis, W7RGL) ..... 50, Apr.
Sporadic-*E* Propagation, Notes On (Jacobs, W3ASK) ..... 60, June

Sunspot Cycle Progress (PROPAGATION) ..... 54, Jan.; 59, May; 76, Aug.
TVI Filter for the 6 Meter Man, A (Brown, W6HPH) ..... 53, June
Transformer Identification (NOVICE) ..... 92, July
Transmitter-Receiver Control Circuits (Green, W3IKH) ..... 30, Jan.
Transmitter Temperature Guage, A (Weber) ..... 55, Mar.
Transmitter Troubleshooting (HAM CLINIC) ..... 71, Nov.
Transmitting Tube Rejuvenation (Dennis, W1WML) ..... 44, Jan.
Troubleshooting Receivers (HAM CLINIC) ..... 64, Oct.
Tunable Audio Slot Filter, A (Davis, K5RKJ) ..... 35, Oct.
Two-Signal Selectivity Measurements (Brogdon, W4UAW) ..... 60, Aug.
U.H.F. Television Transmitter, A (Kaiser, W2VCG) ..... 26, Apr.
Correction ..... 18, Dec.
Vary Your Crystal Frequency (Greenbaum, W1LIG) ..... 42, Mar.
Voltage Regulation The Easy Way (Mickey, W2LCB) ..... 39, Oct.
21 Mc Power Line Filter (HAM CLINIC) ..... 81, July
50 Mc Propagation Effects, Mid-Point Report. On a Six Year DX Study (Monroe & Monroe, K7ALE and K7ALF) ..... 37, June


## MOBILE


Auto Connectors, Those (Hurwitz, WA2HYS) ..... 87, Dec.
Burgle-Proof Your Mobile Installation (Freedman, K2DEM) ..... 38, Mar.
Call Letter Plaque, A Mobile (Schultz, WA2IMG) ..... 90, Dec.
"Dekameter Devil", A 10 Meter Mobile Transmitter, The (Wirth, K8IVJ) ..... 24, Sept.
Mobile Converter, An Inexpensive (Gwin, K5BNS) ..... 40, May
Mobile Monobander, The (Polton, W9BDF/6) ..... 29, May
Mobile Receiver Supply (HAM CLINIC) ..... 80, Mar.
Mobile Stations, Tips On Working (Milius, W4NJF) ..... 54, Apr.
Trunk Storage Hints ..... 33, Jan.
75 Meter Whip, An Economical (Amico, K8IQM & Plesich, W3ZWH) ..... 44, Feb.
90 Watt Mobile Power Supply, A (Steinbach, W7FLC) ..... 134, Nov.


## NEW AMATEUR PRODUCTS


Allied Data *Handbook* ..... 53, May
Aluminum Solder ..... 53, May
Bayroy Coax Relay, The ..... 53, Feb.
Codome ..... 53, May
Comet Operating Desk ..... 31, Mar.
FYO Key, The ..... 26, Oct.
Globe HG-303 Transmitter ..... 53, May
Nuvistaplug, The Raytronics ..... 26, Sept.
Power Distribution Strips ..... 63, Aug.
Rohn Crank-Up Tower ..... 68, Sept.
Twirl-Con ..... 63, Aug.
50 Mc Low Pass Filter, The Gavin ..... 60, July


## POWER SUPPLIES


Combo Power Supply, A (Files, W2PWJ) ..... 34, Oct.
Low Regulated Voltages (HAM CLINIC) ..... 81, July
Mobile Receiver Supply (HAM CLINIC) ..... 80, Mar.
Power Supply Discussion (NOVICE) ..... 78, Feb.
Power Supply Safety Techniques (Barton, W6JAT) ..... 34, Mar.
Transformer Identification (NOVICE) ..... 92, July
Voltage Regulation the Easy Way (Mickey, W2LCB) ..... 39, Oct.
90 Watt Mobile Power Supply, A (Steinbach, W7FLC) ..... 134, Nov.


## RADIOTELETYPE


AFSK Oscillator, A Transistorized (RTTY) ..... 91, Mar.
Correction (RTTY) ..... 94, May
AN/ART-13 on RTTY (RTTY) ..... 96, Aug.
AN/TGV-14 (V), (RTTY) ..... 80, May
AN/URA Series Audio RTTY Converter Operation (RTTY) ..... 81, June
AN/URA Series I.F. RTTY Converter Operation (RTTY) ..... 76, Sept.
Dual Identification Petition (RTTY) ..... 81, May
Keyboard Arrangements, RTTY (RTTY) ..... 69, Jan
Selector Magnet Driver, A Transistorized (RTTY) ..... 84, Nov
Square Wave Dot Generator, A (RTTY) ..... 69, Dec
Terminal Unit, A Transistorized (RTTY) ..... 85, Feb
Correction (RTTY) ..... 94, Mar
Terminal-Unit Power Supply, A Transistorized (RTTY) ..... 88, Apr
Twin-City Terminal Unit, A Tuning Eye For The (RTTY) ..... 96, July
Tuning Fork Standard, Transistorized (RTTY) ..... 68, Oct


## RECEIVERS & RECEIVING


Audio Filters for C.W. Reception (Landahl, W5SOT) ..... 95, Jan
Collins KWM-1 to 40 Meters, Adapter for the (Lawrence, W5GVZ) ..... 32, Aug
Collins 75A-4, General Coverage For the (Benkley, W1OHJ) ..... 44, Sept
Collins 75A-4, Up-date The (SIDEBAND) ..... 76, Nov
Combo B.F.O.—*Q*-Multiplier, The (HAM CLINIC) ..... 28, June
FL-8 Roundup, An (Stoner, W6TNS) ..... 46, July
Fifteen Meter Converter (NOVICE) ..... 65, Apr
Correction (NOVICE) ..... 72, Sept
Gated A.V.C. System for S.S.B., A.M. & C.W., A (Amodeo, W2PCJ) ..... 36, Sept
Hammarlund HQ-120 & HQ-129X, Dials for the (HAM CLINIC) ..... 72, Jan
I.F. Attenuator For Converters (VHF) ..... 61, Oct
I.F. Transformers, Permanently Tuned Ceramic (HAM CLINIC) ..... 81, Feb
Improving Old Receivers (HAM CLINIC) ..... 65, Sept
International Crystal TRC-5B 2 Meter Converter (VHF) ..... 91, June
"Miniceiver," The (Granberg, OH2ZE) ..... 34, Jan
Mobile Converter, An Inexpensive (Gwin, K5BNS) ..... 40, May
National NC-183, Biography of A, Modified (Beaty, W6WNR) ..... 52, Mar
National NC-190 Wiring Corrections (HAM CLINIC) ..... 80, Mar
Noise Generator, A Simple (VHF) ..... 73, Nov
Preamplifier, A Tunable 50 Mc Cavity (Heller, K3HNP) ..... 89, Dec
*Q*-Multiplier Frequency, Changing (HAM CLINIC) ..... 28, June
S.S.B. Reception With A.M. Receivers, (Selwyn, W2GFR) ..... 37, Oct
Correction ..... 18, Nov
"Scan-Pan" Panoramic Adaptor, The (Johnson, ZL2AMJ) ..... 28, Aug
Series-Diode Noise Limiter (HAM CLINIC) ..... 95, Aug
Signal Losser, A (SIDEBAND) ..... 89, July
TRC-8 220 Mc Receiver Conversion, Improving The (Savicky, W3JYL) ..... 44, July
"Ten Verter" A 10 Meter Receiver and Converter, The (Galloup W8PYQ) ..... 41, Dec
Transistorized Preamp For 420 Mc, A (Kaiser, W2VCG) ..... 35, Nov
Troubleshooting Receivers (HAM CLINIC) ..... 64, Oct
Tunable Audio Slot Filter, A (Davis, K5RKJ) ..... 35, Oct
Two-Signal Selectivity Measurements (Brogdon, W4UAW) ..... 60, Aug
V.H.F. Panadaptor, The (Gibson, W8TYY) ..... 26, July
"Wee-Ceiver," A 2 Meter Superregen, The (VHF) ..... 77, Mar
Correction ..... 116, July
2N1177's In A 6 Meter Converter (Houghton, K8ZVF) ..... 58, July
Correction ..... 16, Sept
416B Preamp For 2, A (VHF) ..... 84, July
417A Preamp For 2, A (VHF) ..... 84, July
432 Mc Converter, A German (VHF) ..... 91, June
432 Mc Converter, A Practical (Brown, W6HPH) ..... 45, Feb
50 Mc Transistor Receiver, A Simple (VHF) ..... 61, Oct
$5.00 Frequency Standard, A, (Neidich, K2ENN) ..... 32, Sept
Correction ..... 18, Dec
6CW4 Preamp For 2, A (VHF) ..... 84, July


## SEMICONDUCTORS


AFSK Oscillator, A Transistorized (RTTY) ..... 91, Mar
Determining Transistor Beta (HAM CLINIC) ..... 95, Aug
Diode Multipliers In V.H.F. Exciters (Brown, W6HPH) ..... 36, Mar
Dynamic Speaker To Microphone (HAM CLINIC) ..... 36, June

eath IM-30 Transistor Analyzer (Semiconductors) ..... 83, Jan.
llowatt R.F. Transistors (Stoner, W6TNS) ..... 64, Aug.
Miniceiver," The (Granberg, OH2ZE) ..... 34, Jan.
rametric Multipliers (VHF) ..... 80, Apr.
actice OSCAR Beacon (VHF) ..... 75, Mar.
atings and Characteristics of Transistors (Ham Clinic) ..... 91, Aug.
ries-Diode Noise Limiter (Ham Clinic) ..... 95, Aug.
lar Powered Broadcast Radio (Semiconductors) ..... 88, Feb.
lar Powered 2 Meter Transmitter, A (VHF) ..... 80, Apr.
ansistor Crystal Oscillators (Semiconductors) ..... 83, Jan.
ansistor Replacements (Ham Clinic) ..... 72, Jan.
ansistorized Modulator, An Economy (Nogle, W5TJT) ..... 51, Dec.
ansistorized 1 Kc Oscillators (Ham Clinic) ..... 64, Oct.
Wee-Ceiver," A 2 Meter Superregen, The (VHF) ..... 77, May
ansistorized Preamp For 420 Mc, A (Kaiser, W2VCG) ..... 35, Nov.
Correction ..... 116, July
Meter Phone Transmitter, A Transistorized (Semiconductors) ..... 88, Feb.
0 Kc Crystal Calibrator (Sideband) ..... 73, Feb.
N1177s In A 6 Meter Converter (Houghton, K8ZVF) ..... 58, July
Correction ..... 16, Sept.
Mc Transistor Receiver, A Simple (VHF) ..... 61, Oct.

## SPACE COMMUNICATIONS

ook Review: *Projects Space* (Space) ..... 60, Sept.
ommunications Satellite Act (Space) ..... 69, Nov.
ECHO II Balloon Satellite (Space) ..... 69, Apr.
SCAR I Accomplishments, Summary of (Space) ..... 72, Oct.
SCAR I Launch Date, U. S. Announces (Space) ..... 56, Jan.
SCAR I, Results of (Space) ..... 69, Apr.
SCAR I, Statistics and Honor Roll of (Space) ..... 69, Nov.
SCAR II, Launch Details of (Space) ..... 75, Aug.
SCAR II Reception, Reporting (Space) ..... 80, June
SCAR II & III Discussion of (Space) ..... 98, July
actice OSCAR Beacon (VHF) ..... 75, Mar.
edicting OSCAR's Orbit With Ease (Giro, I1BMV) ..... 58, June
oject OSCAR: A Report, It's History and Future (Jacobs, W3ASK) ..... 30, Feb.
oject OSCAR: A Report, Launch Details and Technical Data (Stoner, W6TNS) ..... 24, Feb.
oject West Ford (Space) ..... 98, July
ace Catalogue (Space) ..... 67, May
ace Frequency Allocations (Space) ..... 57, Jan.
acewarn Frequencies (Space) ..... 67, May
ROS IV Launching (Space) ..... 70, Apr.
RANSIT IV-B/TRAAC Frequencies (Space) ..... 57, Jan.
ansmitting Satellites (Space) ..... 106, Feb.
Mc Satellite Reception (Space) ..... 98, July

## S.S.B. & D.S.B.

dapt-O-Citer," The (Ham Clinic) ..... 29, June
llins KWM-1 To 40 Meters, Adaptor For The (Lawrence, W5GVZ) ..... 32, Aug.
mbination S.W.R. Bridge and Linearity Indicator, A (Sherrod, W5ZG) ..... 22, Oct.
rida Rock Crusher, A (Carter, W4YHW) ..... 42, Apr.
ghty Mouse, The (Spaulding, W6BAF) ..... 41, July
-62, The (Heil, K9EID) ..... 92, Nov.
S.B. Exciter Power (Ham Clinic) ..... 72, Jan.
S.B. Generation, The "Third Method" of (Sideband) ..... 66, Oct.
S.B. Linear Tube Selection (Ham Clinic) ..... 72, Jan.
S.B. Phasing For 2 Meters, Direct (VHF) ..... 79, Aug.
S.B. Reception With A.M. Receivers (Selwyn, W2GFR) ..... 37, Oct.
Correction ..... 18, Nov.
S.B. Test Oscillator, An (Ham Clinic) ..... 80, Mar.
nal Losser, A (Sideband) ..... 89, July
gle Sideband Exciter, A (Tucker, W5VU & Copeland, W5SQT) ..... 54, Feb.
3/ARC-5 For 2 Meters S.S.B. (VHF) ..... 73, Nov.
timate Linear, The (Semkow, W8IIP) ..... 32, July
H.F. Mixer T-Pad, A (Sideband) ..... 70, May
H.F. "Quacker," The (VHF) ..... 61, Sept.
Meter Sideband Mixer (Sideband) ..... 90, Apr.
2 Meters S.S.B., A Beacon Transmitter For (VHF) ..... 61, Oct.
288 Mc S.S.B. Station (VHF) ..... 79, Aug.

## SURPLUS

APX-6 For 1296, Converting The (VHF) ..... 77, May
APX-6 Radiators (Katz, K2UYH) ..... 91, Dec.
AN/ARC-3, Converting The (Kincaid) ..... 48, Feb.
AN/ART-13 On RTTY (RTTY) ..... 96, Aug.
AN/URA Series Audio RTTY Converter Operation (RTTY) ..... 81, June
AN/URA Series I.F. RTTY Converter Operation (RTTY) ..... 76, Sept.
ARC-5/SCR-274N, V.F.O. Conversion of the (McCoy, W8DG) ..... 110, Nov.
BC-221, Frequency Meter (Ham Clinic) ..... 72, Jan.
BC-221, Notes on The (Gordon, W1KWB) ..... 52, Aug.
BC-458, A Ten Meter Conversion of The (Brown, W6HPH) ..... 38, Jan.
FL-8 Roundup ,An (Stoner, W6TNS) ..... 46, July
FMTU30D On Two, Putting The (Seibert, W5VLE) ..... 130, Nov.
Medium Power Final Amplifier, A (McCoy, W8DG) ..... 124, Nov.
Prop-Pitch Motor Antenna Rotator, An Improved (Parsons, VE3QA) ..... 128, Nov.
T-23/ARC-5 For 2 Meters S.S.B. (VHF) ..... 73, Nov.
TRC-8 220 Mc Receiver Conversion, Improving the (Savicky, W3JYL) ..... 44, July
1 Kw Final, A Driver For A (McCoy, W8DG) ..... 118, Nov.
10 and 15 Meter Driver Unit, A (McCoy, W8DG) ..... 121, Nov.
2 Meters S.S.B., A Beacon Transmitter For (VHF) ..... 61, Oct.
24G Multiplier, A High Frequency (McCoy, W8DG) ..... 115, Nov.
304TL Kilowatt Final, A (McCoy, W8DG) ..... 126, Nov.
$5.00 Frequency Standard, A (Neidich, K2ENN) ..... 32, Sept.
Correction ..... 18, Dec.
90 Watt Mobile Power Supply, A (Steinbach, W7FLC) ..... 134, Nov.

## TEST EQUIPMENT

BC-221 Frequency Meter (Ham Clinic) ..... 72, Jan.
BC-221, Notes on The (Gordon, W1KWB) ..... 52, Aug.
Coax Phase Detector, Building and Using The (Geiser, WA2ANU) ..... 24, Jan.
Combination S.W.R. Bridge and Amplifier Linearity Indicator, A (Sherrod, W5ZG) ..... 22, Oct.
Crystal Checker & Frequency Standard (Novice) ..... 95, Aug.
Determining Transistor Beta (Ham Clinic) ..... 95, Aug.
Heath IM-30 Transistor Analyzer (Semiconductors) ..... 83, Jan.
Instrument Deluxe, The (Geiser, WA2ANU) ..... 47, Oct.
*L-C* Box, The (Tartas, W2YKT) ..... 27, Sept.
Millen 90932 Scope (Ham Clinic) ..... 72, Jan.
Noise Generator, A Simple (VHF) ..... 73, Nov.
R.F. Indicator (Novice) ..... 72, Sept.
S.S.B. Test Oscillator (Ham Clinic) ..... 80, Mar.
"Scan-Pan" Panoramic Adaptor, The (Johnson, ZL2AMJ) ..... 28, Aug.
Silicon Diode Checker (Ham Clinic) ..... 78, July
Standing Wavemeter, The (Brown, W6HPH) ..... 30, Nov.
Transistorized 1 Kc Oscillators (Ham Clinic) ..... 64, Oct.
Twin City Terminal Unit, Tuning Eye For The (RTTY) ..... 96, July
V.H.F. Panadaptor, The (Gibson, W8TYY) ..... 26, July
100 Kc Crystal Calibrator (Sideband) ..... 73, Feb.
$5.00 Frequency Standard, A (Neidich, K2ENN) ..... 32, Sept.

## TRANSMITING

ARC/5/SCR-274N, V.F.O. Conversion of the (McCoy, W8DG) ..... 110, Nov.
"Adapt-O-Citer", The (Ham Clinic) ..... 29, June
BC-458, A Ten Meter Conversion of the (Brown, W6HPH) ..... 38, Jan.
Collins KWM-1 to 40 Meters, Adaptor For The (Lawrence, W5GVZ) ..... 32, Aug.
Collins 32S-1 Operating Improvements (Kreager, W6UYW & Gonsior, W6VFR) ..... 47, Aug.
Compact 6 Meter Transmitter, A (Reuter, WØWWJ) ..... 25, Oct.
"Dekameter Devil" A 10 Meter Mobile The (Wirth, K8IVJ) ..... 24, Sept.
Diode Multipliers In V.H.F. Exciters (Brown, W6HPH) ..... 36, Mar.
Florida Rock Crusher, A (Carter, W4YHW) ..... 42, Apr.

Harmonic Crystal Oscillator Design (Mickey, W2LCB) ..... 29, July
Heath DX-40 to 6 Meters (Ham Clinic) ..... 72, Jan.
Heath DX-40 to 6 Meters, Converting The (Ham Clinic) ..... 32, June
Kit Transmitters Work, How (Geiser, WA2ANU)
Part I ..... 36, Feb.
Part II, Conclusion ..... 39, Mar.
Medium Power Final Amplifier, A (McCoy, W8DG) ..... 124, Nov.
Mighty Mouse, The (Spaulding, W6BAF) ..... 41, July
Millen 90932 Scope (Ham Clinic) ..... 72, Jan.
Mobile Monobander, The (Polton, W9BDF/6) ..... 29, Mar.
Motorola FMTU30D On Two, Putting The (Seibert, W5VLE) ..... 130, Nov.
One Tube On Six (Faust, K2VRV) ..... 32, Jan.
One Tube, 30 Watts (Marriner, W6BLZ) ..... 26, Aug.
Correction ..... 18, Nov.
Packaged Power For Six (Mickey, W2LCB) ..... 28, Dec.
Parametric Multipliers (vhf) ..... 80, Apr.
Power On 6—Economically, Medium (Math, WA2NDM) ..... 85, Dec.
Practical Pi-Network Design Data (Marriner, W6BLZ) ..... 44, Aug.
SB-62, The (Heil, K9EID) ..... 92, Nov.
S.S.B. Exciter Power (Ham Clinic) ..... 72, Jan.
Solar Powered 2 Meter Transmitter, A (vhf) ..... 80, Apr.
Single Sideband Exciter, A (Tucker, W5VU & Copeland, W5SQT) ..... 54, Feb.
"Silver Sentry" A Super Stable Variable Frequency Oscillator, The (Smith, W8VVD) ..... 34, Dec.
Six Meter Man, A TVI Filter For the (Brown, W6HPH) ..... 53, June
T-23/ARC-5 For 2 Meters S.S.B. (vhf) ..... 73, Nov.
Three Tubes On Three-Quarter Meters (Brown, W6HPH) ..... 48, Dec.
Transmitter-Receiver Control Circuits (Green, W3IKH) ..... 30, Jan.
Transmitter Temperature Gauge, A (Weber) ..... 55, Mar.
Transmitter Troubleshooting (Ham Clinic) ..... 71, Nov.
Transmitting Tube Rejuvenation (Dennis, W1WML) ..... 44, Jan.
Ultimate Linear, The (Semkow, W8IIP) ..... 32, July
U.H.F. Television Transmitter, A (Kaiser, W2VCG) ..... 26, Apr.
Correction ..... 18, Dec.
Zipper Bag Transmitter, A (Marriner, W6BLZ) ..... 35, May
1 Kw Final, A Driver For A (McCoy, W8DG) ..... 118, Nov.
10 and 15 Meter Driver Unit, A (McCoy, W8DG) ..... 121, Nov.
10 Meter Phone Transmitter, A Transistorized (Semiconductors) ..... 88, Feb.
160 Meter Sideband Mixer (Sideband) ..... 90, Apr.
2 Meter Transmitter, Transistorized (vhf) ..... 84, July
2 Meters S.S.B., A Beacon Transmitter For (vhf) ..... 61, Oct.
220 Mc Transmitter, A Simple, Stable (Brundage, KØHEI) ..... 45, Oct.
Correction ..... 18, Dec.
24G Multiplier, A High Frequency (McCoy, W8DG) ..... 115, Nov.
304TL Kilowatt Final, A (McCoy, W8DG) ..... 126, Nov.
432 Mc Tripler, A (vhf) ..... 91, June
5894 Linear For 2 Meters, A (vhf) ..... 61, Oct.
6 Meter Linear Amplifier, A (Barnes, K9TFJ) ..... 58, Mar.
6 Meter Transmitter, "The Li'l One," A (Ryan, WA2DND) ..... 50, July
Correction ..... 16, Oct.
900 Watts On Six Meter (Ham Clinic) ..... 72, Jan.


## V.H.F. AND U.H.F.

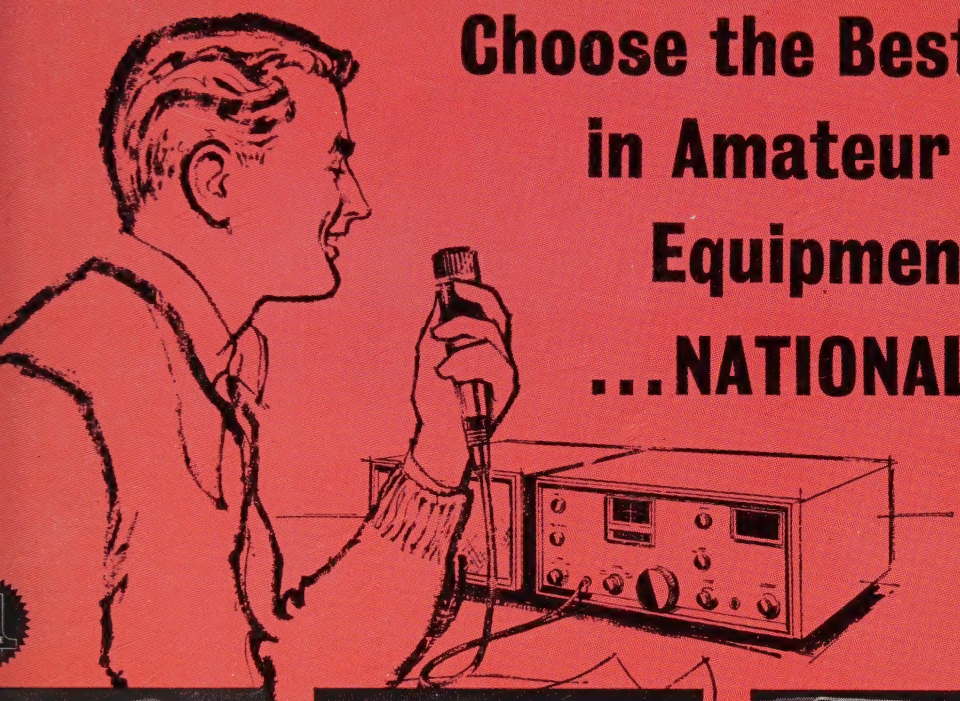

AN/ARC-3, Converting the (Kincaid) ..... 48, Feb.
APX-6 For 1296, Converting the (vhf) ..... 77, May
APX-6 Radiators (Katz, K2UYH) ..... 91, Dec.
Compact 6 Meter Transmitter, A (Reuter, WØWWJ) ..... 25, Oct.
Diode Multipliers In V.H.F. Exciters (Brown, W6HPH) ..... 36, Mar.
Heath DX-40 to 6 Meters (Ham Clinic) ..... 72, Jan.
Heath DX-40 to 6 Meters, Converting The (Ham Clinic) ..... 32, June
I.F. Attenuator For Converters (vhf) ..... 61, Oct.
International Crystal TRC-5B 2 Meter Converter (vhf) ..... 91, June
Motorola FMTU30D On Two, Putting The (Seibert, W5VLE) ..... 130, Nov.
Noise Generator, A Simple, (vhf) ..... 73, Nov.
Notes On Sporadic-E Propagation (Jacobs, W3ASK) ..... 60, June
One Tube On Six (Faust, K2VRV) ..... 32, Jan.
Packaged Power For Six (Mickey, W2LCB) ..... 28, Dec.
Parametric Multipliers (vhf) ..... 80, Apr.
Portable 6 Meter Antenna, A (Heller, K3HNP) ..... 99, Nov.
Power On 6—Economically, Medium (Math, WA2NDM) ..... 85, Dec.
Practice OSCAR Beacon (vhf) ..... 75, Mar.
Preamplifier, A Tunable 50 Mc Cavity (Heller, K3HNP) ..... 89, Dec.
Reverse Tropo? What Is (vhf) ..... 73, Nov.
SB-62, The (Heil, K9EID) ..... 92, Nov.
S.S.B. Phasing For 2 Meters, Direct (vhf) ..... 79, Aug.
Six Meter Man, A TVI Filter For The (Brown, W6HPH) ..... 53, June
Solar Powered 2 Meter Transmitter, A (vhf) ..... 80, Apr.
Standing Wavemeter, The (Brown, W6HPH) ..... 30, Nov.
TRC-8 220 Mc Receiver Conversion, Improving The (Savicky, W3JYL) ..... 44, July
T-23/ARC-5 For 2 Meter S.S.B. (vhf) ..... 73, Nov.
"Ten-Verter" A 10 Meter Receiver and Converter, The (Galloup, W8PYQ) ..... 41, Dec.
Three Tubes On Three-Quarter Meters (Brown, W6HPH) ..... 48, Dec.
Two Meter Beam, A Four Element (Novice) ..... 67, Dec.
U.H.F. Television Transmitter, A (Kaiser, W2VCG) ..... 26, Apr.
Correction ..... 18, Dec.
V.H.F. Beams From TV Antennas (Myers, W5KKB) ..... 44, Mar.
V.H.F. Man's Control Unit, A (Turner, K7MRB) ..... 37, Aug.
V.H.F. Mixer T-Pad, A (Sideband) ..... 70, May
V.H.F. Panadaptor, The (Gibson, W8TYY) ..... 26, July
"V.H.F. Quacker," The (vhf) ..... 61, Sept.
"Wee-Ceiver" A 2 Meter Superregen, The (vhf) ..... 77, May
Correction ..... 116, July
2N1177s In A 6 Meter Converter (Houghton, K8ZVF) ..... 58, July
Correction ..... 16, Dec.
2 Meter Transmitter, A Transistorized (vhf) ..... 84, July
2 Meters S.S.B., A Beacon Transmitter For (vhf) ..... 61, Oct.
220 Mc Transmitter, A Simple, Stable (Brundage, KØHEI) ..... 45, Oct.
Correction ..... 18, Sept.
288 Mc S.S.B. Station, A (vhf) ..... 79, Aug.
416B Preamp for 2, A (vhf) ..... 84, July
417A Preamp for 2, A (vhf) ..... 84, July
420 Mc, A Transistorized Preamp For (Kaiser, W2VCG) ..... 35, Nov.
432 Mc Converter, A German (vhf) ..... 91, June
432 Mc Converter, A Practical (Brown, W6HPH) ..... 45, Feb.
432 Mc Triplier, A (vhf) ..... 91, June
50 Mc Propagation Effects, Mid-Point Report On a Six Year DX Study (Monroe & Monroe, K7ALE & K7ALF) ..... 37, June
50 Mc Transistor Receiver ,A Simple (vhf) ..... 61, Oct.
5894 Linear For 2, A (vhf) ..... 61, Oct.
6CW4 Preamp for 2, A (vhf) ..... 84, July
6 Meter Linear Amplifier, A (Barnes, K9TFJ) ..... 58, Mar.
6 Meter Transmitter "The Li'l One," A (Ryan, WA2DND) ..... 50, July
Correction ..... 16, Oct.
900 Watts on 6 Meters (Ham Clinic) ..... 72, Jan.


## ZERO BIAS

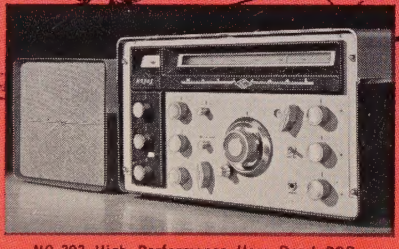

ARRL President, W6ZH ..... 7, July
Christmas ..... 7, Dec.
Citizens Radio ..... 7, Mar.
FCC Warning ..... 7, Oct.
Ham Clinic Issue, Special ..... 7, June
Licensing Fees ..... 7, Apr.
Licensing Incentive ..... 7, Nov.
New York Automobile License Plates ..... 7, June
OSCAR Concept, The ..... 7, Feb.
OSCAR FLASH ..... 7, Jan.
Phone Operation on 20 ..... 7, Sept.
Phone Patching ..... 7, May
Technician Class Amateurs on Ten ..... 7, Aug.
World Wide DX Contest ..... 7, June

Free Equipment Guide helps you

# Choose the Best in Amateur Equipment ...NATIONAL



Band SSB Transceiver; $369



NC-303 High Performance Ham Band SSB Receiver; $449

NC-105 Low Priced General Coverage Receiver; $119.95

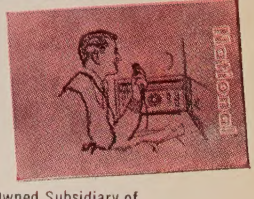
Write for big fact-filled Equipment Guide giving full details of National's entire line of up-to-the-minute communications gear. Tells you all about the new NCX-3 Tri-Band Transceiver . . . the 80, 40 and 20 meter SSB rig with *200* watts of SSB sock together with break-in CW, AM facilities, VOX, S meter, SSB AGC, filter SSB generation . . . and all the other features you want and need for high performance amateur operation at home or in your car . . . at a price you can afford.

This new guide also features National's famous NC-303 SSB/AM/CW Receiver. This versatile receiver has the widest selectivity and frequency range of any ham-band SSB receiver, together with remarkable sensitivity and stability. The NC-303 includes more important operating features for all modes of operation than any other ham-band receiver on the market.

One of six general coverage receivers described in full detail is the modestly priced NC-105. Designed specifically to provide the beginning amateur with a receiver within his budget, the NC-105 has the important features he needs; even a Q multiplier, S meter and product detector! The NC-105 is ideal for the novice or short wave listener or as a second receiver for the more advanced ham shack.

## WRITE FOR FREE COPY OF NEW NATIONAL EQUIPMENT GUIDE

- Complete technical details and features of all National gear
- Tells all about National's exclusive One Year Guarantee
- Helps you choose the right equipment for your needs




NC®

A Wholly Owned Subsidiary of National Company, Inc.

Export: Ad Auriema Inc., 85 Broad St., N. Y. C.

Canada: Tri-Tel Assoc. Ltd., 81 Sheppard Ave. W., Willowdale, Ontario

National Radio Company 37 Washington Street Melrose, Massachusetts

Rush me a free copy of your new Equipment Guide C-12

Name.....

Address.....

City.....State.....

63* in 62

*from the RCA Electron Tube Division*

RCA THE MOST TRUSTED NAME IN ELECTRONICS

*Message Sixty-Three (63) listed in ARRL Log Book: "Most Sincere Wishes for Health, Happiness and Prosperity"